American Aviation

25c | *The Magazine of Air Transportation* | June 1, 1949

Public Convenience

EVERY COMMUNITY of any size in the United States has a bus or trolley car system to provide transportation for the public. In the mornings and in the evenings the vehicles are well filled with people going to or from work. In more than one city this rush-hour traffic is an acute problem. Standing room only is the rule.

by W. W. P.

But at other periods of the day and night these vehicles are only infrequently filled. At times there are only a scattered handful of patrons. Statistics would doubtless show that for the most of the hours of service the nation's local public transportation systems operate at a loss. It would be more economical and certainly profitable to operate buses and trolley cars only during the rush hours or when high load factors were assured.

Yet no one would think of permitting this public transportation system to operate only during the morning and evening rush hours. To serve the community adequately it must start its vehicles early in the morning when the very first few passengers are going to work. It must operate during the dull morning and afternoon periods. It must continue to operate until a late hour at night. The only concession permitted to the operating company is less frequent schedules during the dull hours—but not as infrequent, of course, as the company would like.

During the earlier days of the motor vehicle a few enterprising individuals in just about every community of the country started competing with the trolley cars by using "jitneys." These "jitneys" loaded up in the outskirts and high-tailed it downtown in the morning rush hours, usually on an express pattern to pass up intermediate stops, and usually beating the trolley schedules and often undercutting the trolley fares. In the evening they did a wonderful business out-bound.

In time these "jitneys" were eliminated or at least removed from directly competing routes. Why? They were doing an excellent service for some of the public, and some of the public patronized them. Yet anyone with a grain of sense realized that the community had to make a choice of whether it wanted a sound local transport system operating

(*Turn to Page* 6)

'Salesman Jim' of Capital Airlines

James W. Austin, vice president-traffic and sales for Capital Airlines, in three short years has won industry-wide recognition for an outstanding job of merchandising air transportation. Austin's department has introduced a fresh approach to airline selling, carried through with the most concentrated advertising campaign in the company's history. (See story page 52).

In This Issue

Proved by 10 Years' Performance in Flight Operations!

KEEP LIGHT PLANE engines in *clean condition* for fine performance—*with Esso Aviation Oil!*

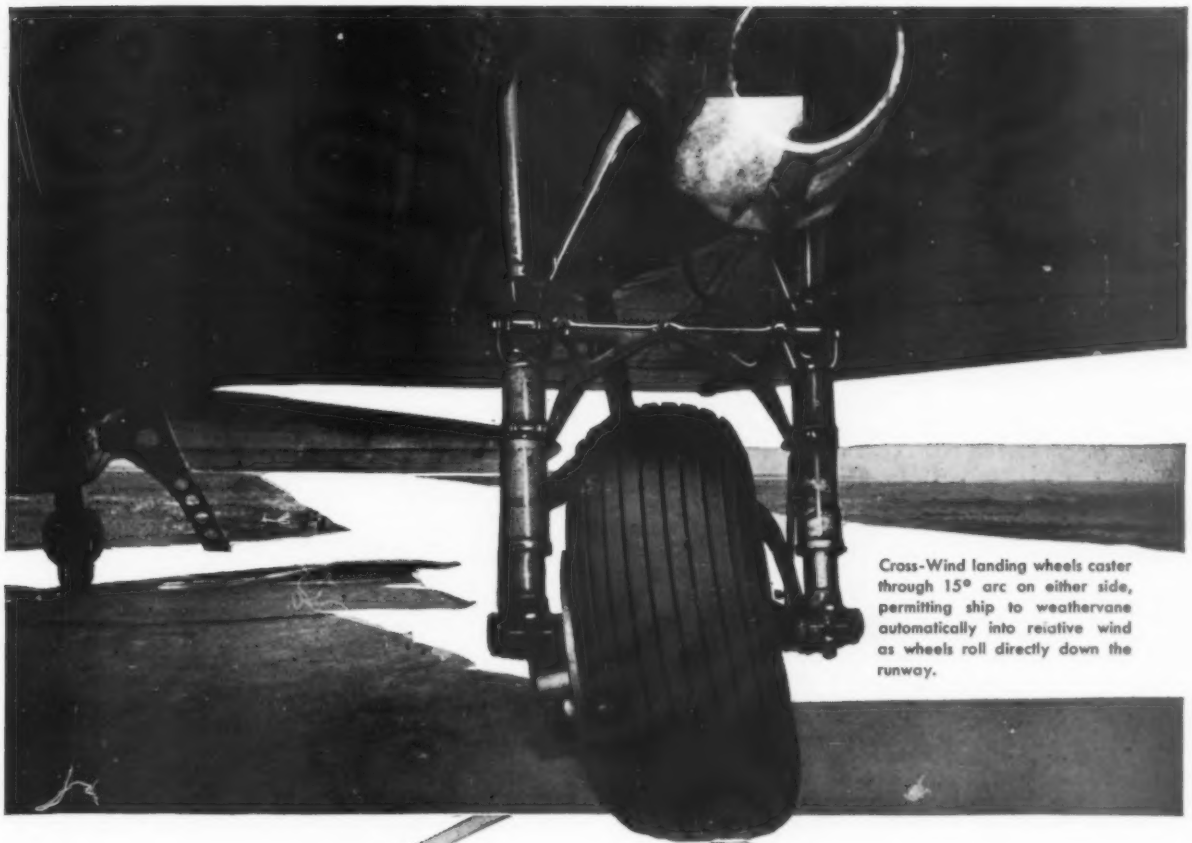
IT'S MADE FROM high quality base stock . . . and it's a detergent-dispersant type aviation lubricant that performs a remarkable *cleaning action* as it lubricates. When oil is changed, suspended carbon and sludge *drains out of the engine!*

PROVED by tests run both in America's largest aviation petroleum laboratories and by a leading manufacturer of light plane engines—**as well as by years of actual use in gruelling operations, under extreme temperatures.**

NEXT TIME you change oil, change to the oil that helps improve the operating condition of light plane engines—ESSO AVIATION OIL! It's available in grades HD 55, HD 65, HD 80 at airports from Maine to Texas . . . wherever you see the famous Esso Winged Oval.

YOU CAN DEPEND ON

Tech.



Cross-Wind landing wheels caster through 15° arc on either side, permitting ship to weathervane automatically into relative wind as wheels roll directly down the runway.

Now approved for DC-3's—The Goodyear *CROSS*-WIND Landing Wheel

No longer are DC-3's restricted to the use of multi-strip airports. Today, they can operate successfully in and out of *single-strip* fields, regardless of wind direction, thanks to the Goodyear Cross-Wind landing wheels. This amazing device, developed for the CAA by Goodyear engineers, is now approved for DC-3's. See what new fields of business the new Goodyear Cross-Wind landing wheels will open up for your fleet. Write for complete information, to:

Goodyear, Aviation Products Division,
Akron 16, Ohio or Los Angeles 54,
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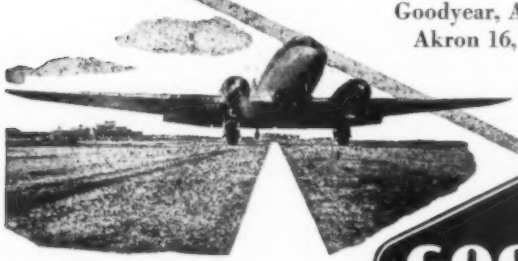

GOODYEAR
AVIATION
PRODUCTS

MORE AIRCRAFT LAND ON GOODYEAR TIRES THAN ON ANY OTHER KIND

News in Brief

Extension of the family fare plan from June 30 for an additional nine months to Mar. 30, 1950, has been requested by 16 trunk and feederlines. If approved by CAB, it would be third extension of plan successfully pioneered by American Airlines last fall.

Separation of mail pay from subsidy elements in mail rate awards is subject of S.J. Res. 92 introduced in the Senate by Sen. Edwin Johnson (D., Colo.) on May 16. Bill would authorize appropriation of not more than $300,000 for the study, would require report from CAB on the matter by Mar. 1, 1950. C. E. Woolman, president of Delta Air Lines, last week told the Senate Interstate and Foreign Commerce Committee that he could not urge too strongly against splitting of mail compensation into different categories. Woolman declared there would have to be as many different rates of service pay as there are carriers, routes, changing seasons and conditions.

Los Angeles Airways has applied to CAB for permanent certificate authorizing carriage of passengers by helicopter, in addition to mail and property. LAA points out that it is fast approaching the maximum capacity of present equipment (5 Sikorsky S-51's), and that extension of certificate is needed to plan for acquisition of new and larger craft. Company states that armed services are interested in carrier's studies with rotary wing aircraft and have expressed willingness to participate, provided operations will be continued long enough to accomplish the objectives.

Trans-Pacific Airlines, which was certificated last November for service in the Hawaiian Islands, was planning to begin scheduled operations about June 1. Carrier will be serving Honolulu, Hoolehua, Maalaea, Upolu Point, and Hilo, using four DC-3's.

Pan American Airways and **Northwest Airlines** on May 16 announced suspension of all flights to and from Shanghai "in the interests of safe operation." Each line left a station traffic manager in the besieged city and has evacuated all other personnel.

Pan American Airways will operate once-a-week extra-fare luxury Stratocruiser service between New York and London, beginning June 10. Sleeperette service will be available at no charge, and 17 regular berths at $25 each. Flight fare will be $10 more than regular $350 one-way rate. Seven-course dinners will be served and cocktails will be on the house.

The charge that Communists are moving in on U.S. airlines was made public May 18 in a resolution adopted unanimously by the international executive board of the Transport Workers Union and presented to CIO leaders. Drafted under guidance of Mike Quill, TWU boss, the resolution was said to be the toughest anti-Communist statement to date from a CIO leader. Resolution called for a seven-man CIO committee to investigate "every phase of Communist party sabotage within TWU airlines division, and if necessary to report on complete reorganization plans designed to exclude the Kremlin errand boys."

Gasoline tax in Hawaii is being cut from 5c to 4c per gallon under compromise reached by the legislature. The airlines sought reduction to 2½c.

Colombia plans to replace passport and visa requirements for vacationists with a simple tourist card, which will be available to citizens of any nation with which Colombia maintains diplomatic or consular relations.

Braniff Airways has signed a five-year air mail contract with government of Ecuador, first such contract on its international route. Braniff will carry Ecuadorian mail and packages southbound to Peru, Bolivia and Brazil, and north to Panama.

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INDEX

BACKGROUND & TRENDS

Among the Airlines

Awaited with interest is **Harvard Graduate School of Business Administration's** study on **airline competition.** Present hope is that manuscript will be completed by July 1 and that it will be published during the summer . . . Airlines hoping for repeal of **15% transportation tax** will watch with interest a bill (S. 1908) introduced by two Senators to amend the Internal Revenue Code by levying a tax on amounts paid outside the U. S. for transportation beginning in the U. S. This would hit at present practice of buying tax-free tickets in Canada and Mexico—a practice that observers believed was increasing chances for repeal of U. S. tax. Authors are Sen. J. Howard McGrath (D., R. I.) and Owen Brewster (R., Me.).

Noticeable in recent upswing of airline traffic is **public preference for fastest service.** On transcontinental routes, preference is for DC-6's and Constellations. DC-3's are suffering when other planes are available, except where price is a factor . . . **TWA** is trying to work out arrangements to acquire some more Constellations on a "pay as you go" basis. It needs them on international routes. For example, next year is the Catholic Holy Year, and U. S.-Rome traffic is expected to hit an all time high.

Western Air Lines believes that if it can maintain present level of costs and mail rates, it has a good chance of showing a net profit this year with a 51% load factor . . . High density seating (up to 104 per plane) in some of its Boeing Stratocruisers is reported under consideration by **Pan American Airways** . . . CIO's executive board has claimed U. S. international airlines operate under **a "short crew policy."** It wants in each crew a pilot, co-pilot, flight engineer, flight radio officer and navigator, and adopted a resolution supporting Senate bill 1768 which would implement its demands.

Feederlines

CAB's show cause order to **Trans-Texas Airways** to give evidence why it should not cease operations in May, 1950, may have named **Pioneer Air Lines** to take over a major portion of TTA's routes, but Pioneer intends to work to keep its fellow feederline in business, says Robert J. Smith, Pioneer president . . . **S. J. Solomon,** who has been representing **Roscoe Turner** in Washington, states that necessary equipment and financing will be available to Turner to enable him to start his feederline by July 1. Solomon isn't ready to reveal details . . . Another feederline, **Southern Airways,** was to start operations June 1.

Railroad Advertising

Railroads are hitting directly at air travel in advertisements (there have been reports, incidentally, that some major roads are considering lower coach fares). **Chicago and North Western** published a "check list" in a recent ad. Single item checked for air travel: "faster." Checked in favor of rail travel were: lower coach fares, more dependable in any weather, more liberal baggage allowance, coach accommodations always available, wider range of schedules from the "heart of town," convenient downtown stations, greater comfort ("plenty of room to walk around and relax"), and children up to five years of age free . . . **Great Northern** took a very dim view of **Northwest Airlines'** ads which it said compared air coach fares with rail plus Pullman, instead of with rail coach. GN took large ads, under the heading "No Seats in the Baggage Car," obviously referring to NWA's combination passenger-cargo DC-4's (but saying nothing about the comfortable seats). Ad accused airlines of "bamboozling" the public with "misleading" comparisons. **Milwaukee Road** also advertised, stating that rail coach is cheaper than fares on "cargo" planes. Meanwhile, NWA was reporting satisfactory load factors on its coach service.

Trans-Atlantic Traffic

The three U. S. trans-Atlantic airlines in first four months of this year carried 70% of the passengers traveling between the U. S. and European points in both directions, 70% of the cargo, and 77% of the mail, according to reliable sources. The three lines—Pan American, American Overseas, and TWA—operated 73% of the passenger flights and 88% of the all-cargo flights. During the four-month period, traffic in both directions amounted to 55,906 passengers—26,132 eastbound, 29,774 westbound.

Navy and Air Travel

The Navy is quietly considering a **change in its travel rules** which, if made, can mean a substantial amount of business for the scheduled airlines. Whereas present rules result in most personnel using the train, the new proposal would take into consideration per diem savings, time savings and salary. If savings were sufficient, air travel would be issued.

Diplomatic

Argentine government's decree **nationalizing FAMA,** its international airline, and three domestic airlines (government policy is to assume control of all "public services") is expected to mean further delay in consummation of a route annex to U. S.-Argentine bilateral aviation agreement. The three domestics, which were "mixed" companies (both government and private participation), are **Aeroposta Argentina, ZONDA** and **ALFA.** U. S. will probably wait and see whether nationalization has any effect on Argentine policy toward routes. The bilateral was signed after negotiations by James Landis when he was CAB chairman, but there's never been agreement on routes to be flown by U. S. and Argentine airlines. Just before nationalization, Argentina submitted a new route proposal. State Department isn't saying what it contains . . . **International Civil Aviation Organization** has asked member states what they think about making another attempt to work out a multilateral civil aviation convention. U. S. airlines are cool to the idea.

Advice on Insurance

Insurance agents who may have been wondering about the aviation market have been advised by **Associated Aviation Underwriters** to forget the fact that fewer two-place planes are being built this year ("few were being insured and those, in many cases, were unacceptable") and to concentrate on other markets. There are (1) executive-type planes ("they are, almost without exception, insured for their full value and with high limits of public liability, passenger liability and property damage," also compensation on the pilot), (2) fixed base liability coverages for the airport operator, hangar-keeper or repair shop operator, and (3) aviation accident coverage. Says AAU: forget the "overselling which was done in 1946 and 1947 and the more glamorous phases of aviation and settle down to develop the business that is available . . ."

EDITORIAL

(CONTINUED FROM PAGE 1)

from early morning until late at night in all parts of town, for the overall benefit of everyone in the community, or whether it wanted a chaotic condition serving only a portion of the community and bankrupting the public utility in favor of a rush-hour peak-load high-density jitney system that operated only when the loads were good and profitable.

There isn't a public transportation system in the country that couldn't cut its price sharply by trimming its operations to service only the high-density long-haul traffic at peak periods. It could dispense with much equipment, fire a lot of personnel, forget about ordering new equipment and just do a bang-up job of loading up on the heavily traveled routes at the operator's economic convenience. But it wouldn't be performing a public service and it wouldn't be a public utility.

There has been no more nonsense ever written about aviation than has appeared recently in some of the aviation trade press and national magazines about the non-scheduled low-fare passenger operations across the country. The analogy between this non-sked service with its skeletonized organizations, undependability and rush-hour psychosis, and the early hectic days of jitney buses in most American communities, is very close and very apt.

The worst blow that could fall on a non-sked operator would be for the CAB to grant him a permanent certificate to operate between San Francisco/Los Angeles and New York City, but with 22 intermediate points to serve and a condition that each of the intermediate points receive a minimum of two flights each way per day.

The non-sked operator, who is the most heavily-subsidized operator in the aviation picture today by reason of the equipment and personnel training provided largely at taxpayer's expense, would then be faced with a series of challenging problems. Among the first would be the hiring of station personnel and setting up the stations. A teletype system coast-to-coast would be essential. Traffic men, dispatchers, communications people, clerks, countermen, etc., would have to be hired not only for three shifts per day in many instances, but for seven days a week as well.

Negotiations would have to be carried on with 24 airports because the non-sked would be a full-fledged public utility. In addition to landing rights there would be space for counters, communications men, and the like. Ramp equipment would have to be bought or built. Before very long the various unions would be sitting on the doorstep to negotiate fair wage and working agreements on a par with his transcontinental competitors.

Having acquired C-47's and C-54's at a fraction on the dollar from surplus stocks (when only veterans could buy the equipment), our "non-sked" would soon find the need for additional equipment. It would not be long until competitively he began to feel the need of new aircraft, new engines and new parts. Equipping an airline runs quite high in the millions and the money doesn't come easily.

Before long the non-sked would have to have some vice presidents to handle local problems and the expanded personnel and operations. The accounting department would begin to grow. The Post Office would be squawking because several departures at major terminals didn't fit into the mail pattern. A state legislature would pile on a heavy tax in the midst of the route. Some serious maintenance trouble would necessitate hiring expensive engineers and they'd have to be traveling to conferences at company expense to get at the root of the trouble. Joining the ATA, Air Cargo, Inc., and Arinc, all costs money and takes time. Before long our former non-sked is involved in ten different CAB cases of one sort or another and the lawyers eating up the revenues pretty fast.

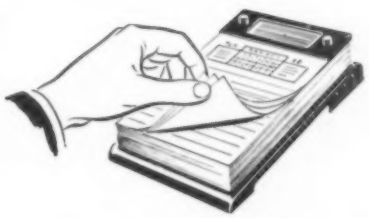
One of the worst headaches would be the fare business. Our non-sked was told by the CAB that he was expected to continue the low-fare service, of course, since the non-sked had not stinted in his promises of what he could do. But the headaches in interline agreements, equalizing of fares, selling connecting space and effecting good connections coast to coast, were something terrific. And the depreciation cost on the new aircraft, that new maintenance hangar and those other capital expenditures! Something awful. And 18 of the 22 intermediate stops were raising holy ned either about the schedule timing or the lack of service. Our operator was no longer his own master operating at his own convenience—he was a full-fledged servant of the people.

We read the other day that "the public" was "demanding" or going to demand non-sked low-fare service, but from all we can gather "the public" is principally a group of people either in two cities on the west coast or in New York. The American public lives other places besides those big cities. If we are thinking in terms of a national air transport service we have to think of the El Pasos, the Charlottes, the Omahas, the Amarillos and hundreds of other points. And the price to the public for doing an over-all service job to the nation is not determined by the rush-hour long-haul high-density routes, but an equalization of the whole picture.

It is perfectly true that there is a much bigger market awaiting the airlines in the lower fare brackets. It is perfectly true that air fares must come down. It is all too true, also, that some airlines haven't really begun to reduce their day-to-day expenses. But the way to reach the goal of lower fares is not to dilute the high-density pay traffic which supports the less profitable services, but to attack the problem nationally and across the board. There is nothing mysterious about the choice to be made, either we scrap the bulk of airline services and concentrate exclusively on high-density long-haul routes with depreciated airplanes, or we continue to build up a healthy air transport industry and give everyone a break on the fares and service as soon as economically possible.

WAYNE W. PARRISH.

FLY UNITED AND YOU SAVE DOLLARS AND DAYS



Is *travel* one of the things your company buys? If so, there's a helpful man you ought to know. He's your local United Air Lines representative. Have him call and study the traveling your operation requires.

Chances are he can show you some interesting cash savings. Like this example — typical of many destinations on United's route.

ROUND TRIP, CLEVELAND TO NEW YORK

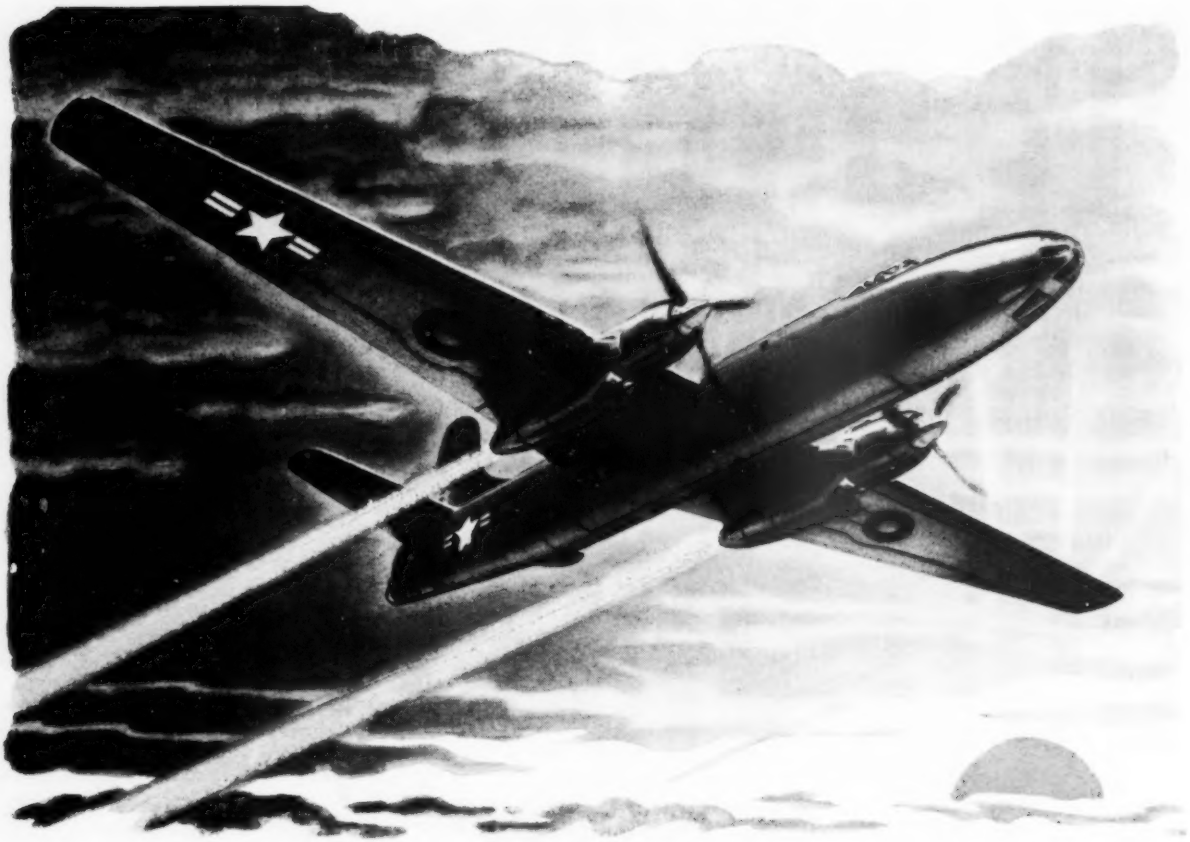
	1st Class Train Fare	*United Air Lines*
Fare	$42.10	$47.70
Lower berth	10.10	..
15% tax	7.83	7.16
TOTAL	$60.03	$54.86

But the greatest economy is *more efficient use of time.* What's a day worth in salary of the average person who travels for your company? On United — the only airline that links the East, Midwest, *all* the Pacific Coast, and Hawaii — several days can be gained on a cross-country trip, several hours on inter-city flights.

YOUR BEST DOLLAR BUY IS WHEN YOU FLY UNITED

PASSENGERS • MAIL • EXPRESS • FREIGHT • PARCEL POST

UNITED AIR LINES



NOW- Jet Power for Patrol Planes

The speedy Martin Mercator patrol plane seeks out its quarry over long distances. Flashes in like a skilled boxer. Slams home its slugger blows. Then lights out at top speed. Most elusive aircraft of its kind ever built, this Navy patrol plane has fighter-type maneuverability—with a high rate of roll—a high rate of climb—and a quick response to controls unusual for a plane of its size and carrying capacity!

Its 20 mm. turrets and other armament make it a powerful offensive and defensive weapon. It has the cruising stamina to find its target and return over long distances. Two reciprocating engines for economical long-range power—and two jets for extra bursts of speed—are uniquely teamed in two nacelles. The Martin P4M Mercator is the first jet-powered patrol airplane— another first in a long line of great Martin planes that have strengthened our Navy's air arm! The Glenn L. Martin Company, Baltimore 3,Md.

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Builders of Dependable *Aircraft Since 1909*

Established
June 1, 1937

American Aviation

Volume 13
Number 1

Industry Kept in Turmoil:

AF Wastes $71 Millions Through Plane Cancellations

By James J. Haggerty, Jr.

According to our calculations, 167,848 American taxpayers' ill-afforded payments were made in vain last year. The Air Force threw their money away through a poorly regulated aircraft procurement program which required repeated expensive contract cancellations and cutbacks.

Cancellations and procurement readjustments during the fiscal year 1949, which ends June 30, will cost the Air Force $71,000,000—and if you divide that by the average tax payment of $423 per capita you get the somewhat startling number of ill-used citizens mentioned above.

In addition, this fumbling program did little to help the aircraft industry find a post-war balance. It's difficult enough to keep the industry going on what money is available. But in a program where funds are shifted and contracts cut back and canceled without apparent rhyme or reason, causing manufacturers to hire one month and fire the next, to order materials one month and kill the order the next, and to shift work from one plant to another to meet the ever-changing work load, the result is confusion on a grand scale.

Air Force officials mumble embarrassedly that the $71,000,000 is not a total loss. That is only the amount reserved to terminate the canceled contracts, they say. They claim that salvage of parts and materials will recover a large part of the total and that actual cancellation costs will probably only be $42,734,000.

Loss Probably Higher. This may be; but they admit that is only an estimate, and industry sources involved either directly or indirectly will tell you that it is an extremely optimistic estimate of salvage savings. As a matter of fact, these same industry sources will tell you that the $71,000,000 set aside for terminations is also an optimistic reserve fund, and that the year's cancellations may cost as much as $100,000,000 by the time the myriad subcontractors and suppliers figure up their damages. But whatever the eventual figure, it will be a lot of money down the drain, because of short-sighted procurement planning, inconsistency, and vacillating policy.

Congress appropriated $1,542,000,000 for USAF plane procurement during fiscal 1949. In June, 1948, the Air Force issued 14 production contracts totaling $1,345,000,000. *Five* of these contracts were later canceled.

In September, three more contracts with a total value of $103,600,000 were let. *Two* of the three were later canceled.

In October a third purchase request was approved and the Air Force let five more contracts and set aside money for a sixth, pending determination of which contractor would build the plane, the H-10 helicopter. The H-10 allocation and one other contract were later scrubbed.

Navy Record Better. Since then the Air Force has managed to struggle through with no other cancellations, but the damage was done: eight contracts for seven different plane types with a total value of $604,000,000 canceled at a cost of $71,000,000, or roughly 4.6% of the total money appropriated. By contrast, the Navy has canceled only three of 22 contracts let this year, with a total value of $26,500,000, and at comparatively little cost.

In addition, where the Air Force allocated all of its appropriated money in the first six months of the year, thereby necessitating cutbacks and cancellations when it wanted to buy a new plane type, the Navy, proceeding with more caution in its programming, still has not spent all of its 1949 money.

Why do these contract cancellations cost so much? Well, let's take an example. The Boeing B-54 contract, while not at all typical since it is one of the most expensive cancellations of all time, serves as an excellent illustration because of that fact.

Case History. The B-54 would have been an advanced type Superfortress, larger, heavier, and with Pratt and Whitney R-4360 VDT compound engines instead of the regular Wasp Majors. The Air Force let two contracts for B-54's: one in June of last year for 30 planes at a cost of $132,300,000, and another for 13 planes, costing $57,300,000, in September.

In letting the contracts, however, the Air Force advised Boeing that it would be a good idea if Boeing would spread the work around; for Boeing was the "fat cat" of the industry with a backlog that had the other companies green with envy. So Boeing, anxious to please its best customer, laid on the subcontracts with a lavish hand.

Over 100 subcontractors, accessory manufacturers and suppliers were given contracts for B-54 components and materials. The subcontractors, in turn, let contracts for materials. And Pratt and Whitney Division of United Aircraft Corp., the engine manufacturer, let contracts for accessories and materials for

What $71,000,000 Could Do for Aviation

The $71,000,000 wasted during the current fiscal year through short-sighted Air Force procurement planning and shifting policies could have been spent usefully on numerous worthwhile projects, a few of which are outlined below:

In transport procurement, $71,000,000 would buy
79 Douglas DC-6's *or* 71 Lockheed Constellations *or* 144 Convair Liners

In jet transport program.* $71,000,000 would permit

Research and development on 2 experimental models	$33,000,000
Procurement of 10 more planes for service testing	34,000,000
Two years of service test work	4,000,000

In long-haul air freighter program.* $71,000,000 would permit

Research and development of 2 models	$18,000,000
Procurement of 6 planes for service testing	10,800,000
Two years of service test work	2,900,000
Procurement of about 50 production models	38,700,000

In lightplane field, $71,000,000 would probably develop any type of utility craft desired. Personal Aircraft Counsel of Aircraft Industries Association in 1947 recommended to the Finletter Commission that there should be provided $5,000,000 annually for development of lightplanes by military services and additional $5,000,000 for annual procurement of light aircraft.

With helicopters, $71,000,000 would go a long way toward development of transport rotorcraft. In decade 1938-48, the Air Force spent only $13,000,000 on helicopter development.

*Figures based on recommendations of Prototype Working Group of the Civil Transport Aircraft Evaluation and Development Board.

what is probably the most complicated engine ever built.

And, then, in April, 1949, the blow struck. The Air Force canceled the prime contracts. The result was disastrous. Boeing immediately canceled all its subcontracts, and the subcontractors canceled orders with suppliers. But each of these cancellations cost money, and plenty of it, for some of the companies had been working on the project for six months and were well along with it.

Consolidated Vultee Aircraft Corp., for instance, had finished the first of 28 nose sections for the B-54 and the others were partially completed. What was to be done with them? The demand for B-54 nose sections on the open market is pretty slim. So, in return for the more than $5,000,000 that Convair had spent on the nose sections, the Air Force got a pile of scrap, the salvage value of which is only a fraction of the expenditure. Multiply this loss by the number of subcontractors involved (although, of course, most of them were working on considerably smaller contracts) and you have an idea of what happens when a prime contract for a new plane is killed.

Damage Snowballs. But the damage doesn't stop there. Continuing the B-54 illustration, Boeing would have built the plane at its Seattle plant. The company maintains a large work force at Seattle and wants to keep it going full tilt, in order to be ready for future production orders, such as the B-52, slated to be the successor to the Convair B-36 in the heavy bomber field.

So Boeing, faced with a work shortage, looked around for new jobs for Seattle. The company didn't have to look far, since Boeing had let more subcontracts than any other company. The answer was simple—withdraw some subcontracts.

Forthwith, Boeing canceled part of a power pack contract with Bell Aircraft Corp.; recalled some B-50, C-97 and Stratocruiser work from its Wichita Division; cutback subcontracts for work on the B-47 six-jet bomber held by The Glenn L. Martin Co. and Curtiss-Wright Corp.'s Airplane Division.

Convair, in its turn, having been forced to kill its B-54 nose section line at San Diego, called for the transfer of some B-36 component work from its Fort Worth plant to the San Diego plant. And so the snowball rolls.

It would probably take the entire General Accounting Office a couple of months to determine exactly what it cost to kill the B-54 contract. Our estimate, based on information obtained from reliable industry sources, is that it will cost the government about $30,000,000 for the airframe cancellation alone; and Pratt and Whitney may have to cut back its VDT engine program (although there has been no decision as yet).

How It Happened. Are these costs legitimate and inevitable? Or were they incurred through lack of intelligent planning? Let's review the record and see.

The first came in October, when the Air Force killed its Curtiss F-87 project. The F-87 was originally a four-jet-engine night and all-weather fighter almost the size of a Flying Fortress. In flight tests, however, it became apparent that the big fighter didn't have the speed and maneuverability desired. So they decided to modify it—substitute two more powerful engines for the original four and taper the plane down a bit.

Then, without bothering to build a prototype to see how this idea would work, the USAF issued a production order for 88 F-87A's in May. But in October, after Curtiss-Wright had been working on the project four months, boosting the cancellation costs with every day's work, the project was killed. The money was transferred to a new night and all-weather fighter, Northrop F-89.

But the experimental model of the F-89 had only been flying about a month, certainly not enough time for a complete evaluation of its capabilities—*and the two-engine F-87A prototype had not even been completed.* Who, then, was in a position to decide between these two planes? Why had the F-87A production order been let in the first place?

The next cutback came in December, when the Air Force decided to kill plans for the last 100 Republic F-84's in its program. This was a legitimate change in requirements. The Air Force had close to 1,000 F-84's on order in addition to the last 100, and scheduled delivery dates overlapped those of newer, more modern fighters. This change in planning wasn't very expensive, since no new tooling had been ordered—several hundred models of the F-84 had been built when the contract was let.

The remaining cancellations are subject to most of the criticism. They include orders for 30 Northrop B-49 eight-jet bombers, 51 North American B-45 four-jet bombers, 118 North American F-93 jet fighters (a modified F-86 powered by an advanced model of the British Nene engine), 30 Northrop C-125 assault transports and the super-costly Boeing B-54 project mentioned before. Also canceled was an allocation for Kellett H-10 helicopters, but since the contract had never been let, no money was involved.

B-36's Wanted. The reason for these terminations was primarily the Convair B-36. The Air Force wanted to order 75 more of them, and, having spent all of its money, had to start chopping other contracts. The new interest in the B-36, which had been a "dead duck" only a few months earlier, was inspired by the AF finding that jet fighters are unable to intercept the bomber at altitudes above 40,000 ft. The Air Force allegedly discovered this new ability of the B-36 in extensive interception tests conducted at Eglin, Fla. and Muroc, Calif.

But here's the catch. The Air Force "finalized" its procurement program for fiscal 1949 in early May of last year. *Not a single, lone B-36 was included in the program,* in spite of the fact that the interception tests proving the "invulnerability" of the B-36 had been going on for about three months.

But let's give Air Force planners the benefit of the doubt. Let's assume that the interception tests had not been sufficiently evaluated by May and that some more time was required to study the situation. The Air Force hadn't spent all of its money in May—it still had $197,000,000 left, part of which it spent in September. But still no B-36's. And in October, the last of the money was spent—and still no B-36's.

Weak Answer. It was not until the latter part of December that the decision was "finalized" to revive the B-36 program. The reason given at that time was that the President's budget, which called for a 48-group Air Force, placed emphasis on long-range bombing. The reason is pretty weak—anyone who has been exposed to Air Force propaganda knows that long-range bombing has never been subordinated by USAF.

If the 75 B-36's had been included in the program at the outset, or if money had been reserved for them pending a complete evaluation of the interception tests, the Air Force would have saved about 90% of its $71,000,000 termination reserve. The puzzling question is: "What did they find out in December that wasn't known in May?"

In defending this very program before Congress last year, W. Stuart Symington, then and now Secretary of the Air Force, said: "Good business practice is becoming standard (in the Air Force). We are giving careful consideration to every aspect of procurement. Trained businessmen are moving into the business jobs. Our system has been completely reorganized to provide greater security against . . . irregularity."

Good. When does it go into effect?

Richter & New TACA President

In one of last photographs taken before his death from cerebral hemorrhage on May 15 (see OBITUARY, page 58), Paul E. Richter, one of the founders of TWA and until recently president of TACA Airways, S. A., is shown here on the left at a meeting of TACA directors in Mobile, Ala., last March. In center is Francis H. Inge, who on May 24 was elected president and general counsel of the company. Inge is senior member of the legal firm of Inge, Twitty, Armbrecht, and Jackson, and has served on the TACA board and as vice president and general counsel for past two years. On the right is Jack Thornburg, executive v.p. of TACA.

Lockheed Plans New Cargo Version of Constellation

On the design board, Lockheed Aircraft Corp. is projecting its Constellation series on into the Model L-949 in preparing to make use of new developments in reciprocating power plants.

The proposed L-949 Speedfreighter is an elongated cargo version of the Constellation, which would be stretched out an additional 18 ft. 4 in. in fuselage length and would have a gross takeoff weight of 123,000 lbs. Like the projected L-849 (AMERICAN AVIATION, Oct. 15, 1948), the L-949 would be powered by the new Wright Turbo Cyclone 18 compounded engine.

Both of these airplanes may be regarded as likely projects for 1950 since Lockheed's current Constellation production line is scheduled to extend into next year on several airplanes, including airline re-orders and the two Connies for the Navy.

The L-949 represents Lockheed's entry of a fast, heavy-duty transport for the growing air freight market to be ready when the latter is prepared to make use of it. As a matter of fact, Lockheed already has submitted the proposed airplane and has prepared operations studies on its possibilities in long-range air freight service.

35,000-lb. Payload. Picking up the additional power and fuel economy provided by the compounded engine, the L-949 would be capable of carrying a full space-limit payload of 35,000 lbs. coast-to-coast eastbound. High headwinds would require a refueling stop or a lessened payload in the westerly direction. It could, however, retain its full capacity payload flying from Chicago to Los Angeles at an altitude of 20,000 ft. against a headwind as high as 68 mph.

This makes the L-949 fit in with the desires of those air freight operators who feel that the big potential in the transcontinental air freight market can't fully be realized until next morning delivery is attainable.

"When the day comes that, no matter where you are in the United States, you can put in an order on one day and be told you'll have what you want the next day, then air freight will really make an impact on the economy of this country," is the way one air freight executive puts it.

Experience has proved it is impractical to schedule out cargo flights before late in the evening, 9 to 11 p.m. Reason is freight doesn't become available until after the close of the business day. Similarly, experience has indicated that early arrival is necessary because traditionally deliveries are started—and expected—in the morning. Afternoon arrivals, bringing delivery the next day, take some of the punch out of air freight in competition with four-day coast-to-coast service by Railway Express.

Profit Potential. The fuel economy of the compounded engines, together with the greater space-weight capacity of the larger fuselage, appears to make the L-949's ton-mile costs for long-range flights average out at a point where air freight could be carried profitably at present tariffs. Direct flying costs per ton-mile, based on a 100% load factor, are estimated at approximately 5½c for a typical domestic operation.

The L-949 would have a maximum cargo volume of 5,713 cu. ft., of which 4,950 cu. ft. would be in the elongated main cargo compartment. It would have a total floor area of 1,056 sq. ft., of which 744 sq. ft. would be in the main compartment.

Plans for the L-949 call for large loading doors both forward and aft. Forward door would be 72 in. by 96 in. and the rear door 72 in. by 109 in.

Cruising speed of the L-949 at 20,000 ft. after taking off at full gross of 123,000 lbs. would be 315 mph pulling 1650 hp and 275 mph using 1390 hp, the latter being the most economical speed. The Wright Turbo Cyclone 18 compounded engine has a takeoff rating of 3,250 hp.

CAA minimum runway length for the L-949 at 123,000 lbs. would be 6,440 ft. Landing runway length at maximum landing weight of 103,000 lbs. would be 5,700 ft.

Aside from adding the 18 ft. 4 in. fuselage section and modifications required for installation of the compounded engines, the L-949 would involve no major structural changes from Lockheed's L-749 Constellation now in service. Wing and empennage are of the same dimensions.

Kaman Offers 'Package' Lease for Helicopters

A helicopter lease plan to provide a means of service testing the recently certificated K-190 utility twin-rotorcraft has been disclosed by Charles H. Kaman, president of Kaman Aircraft Corp. The lease package includes a K-190, complete insurance coverage, trained operating personnel, and a guaranteed maintenance contract.

Lease terms generally are $2,700 per month, plus $10 per flying hour. At a rate of 100 hours monthly, this would permit an average operating cost of $37 per hour, compared to current average of $60-$90 based on 100-120 flying hours per month.

KAC will have six K-190's ready in the near future for lease under the plan. Kaman said he has firm commitments for three of the six, including a Syracuse, N. Y. flying service, a New Jersey farmer, and the Maine Potato Growers Association. Humble Oil Co. was reported interested in a pontoon version for oil exploration work. In addition, Kaman plans leases in at least two European countries this year.

Kaman feels that months of operation under lease arrangements will enable him to produce a better product when he is prepared to offer the K-190 for sale in about a year. No price has been set on the craft, which was being demonstrated for members of Congress and governmental agencies in Washington last week.

The K-190 was developed at a cost of $425,000, well below published figures of $1,500,000 and $5,000,000 for other commercial helicopters in production today, Kaman stated. The company recently was awarded two development contracts by the Navy.

Twin-Rotor 'Copter— Flying in formation at Bradley Field, Windsor Locks, Conn., are the world's first commercial twin-rotor helicopters. The twin rotorcraft, now in production at the Kaman Aircraft Corp. plant, utilize a unique servo type of control system, feature ease of flying and extreme maneuverability.

Helioplane Publicity Stirs Mixed Industry Reaction

There's mixed reaction in the industry as to the effect which the Helioplane will have on the lightplane market. Some feel that the immediate effect will be to retard sales. Many prospective customers will hesitate to buy a conventional aircraft when one providing revolutionary performance appears to be so near at hand. There's general agreement that it will stir the manufacturers of other light aircraft to greater effort in improving lightplane utility.

The Helioplane, if it meets the announced performance, will fill the anticipated requirements for an aircraft with greater potential utility. It will take-off in 90-100 feet, clear a 50-foot obstacle in 300 feet, cruise at speeds over 100 mph and maintain controllable flight at speeds as low as 27 mph. Major reductions in operating noise levels have been accomplished through the use of a patented muffler and a new Aeromatic propeller. It is stall and spin-proof.

Combining these characteristics with a cross wind land gear, the Helioplane should make it possible to utilize a single strip airport "close-in" to the city, since the runway length requirements of previous aircraft, and the objectionable noise levels, are the main obstacles to such airports. In making this possible, the new aircraft would provide major reductions in traveling time between cities. Reduced traveling time between airports and their respective cities does more to reduce city to city travel time than appreciable improvements in cruising airspeeds.

Many Features Not New. Many of the features of the Helioplane are not new, yet the U. S. Air Force has had an outstanding specification calling for such an aircraft for a number of years. To date, no aircraft has met the requirement. It was the engineering genius of Dr. Otto C. Koppen that coordinated available information and filled in the gaps that have defeated earlier attempts. Koppen is professor of aeronautical engineering at Massachusetts Institute of Technology. This is not his first endeavor in lightplane design. He was prominently associated with the Skyfarer, a twin tailed light airplane introduced before the war.

To improve take-off characteristics, one of the major factors in the new performance figures, it was necessary to use sizeable wing flap area. Others have used this same approach but have found that in obtaining a 2% increase in lift, such flaps increased drag by 4%. Existing powerplant and propeller combinations simply didn't provide enough thrust to overcome the additional drag.

Working with the Aeromatic Propeller Division of Koppers Company, Koppen designed a two bladed propeller having a diameter of 9 feet, unusually wide blades and constant speed control. The result was unparalleled in earlier aircraft designs.

In insuring adequate flap area, Koppen combined the aileron and flap mechanisms. The ailerons are operated in a normal manner by the control stick. When flaps are used, a crank in the cockpit is turned to lower both ailerons as desired. From then on, aileron movement is from the preset position of the flap. To overcome aerodynamic problems of this arrangement, the rudder was split into two sections. The lower part of the rudder is interconnected to the aileron control and moves independently of rudder pedal action to provide unusual stability.

The upper part of the rudder operates conventionally from the rudder control pedals.

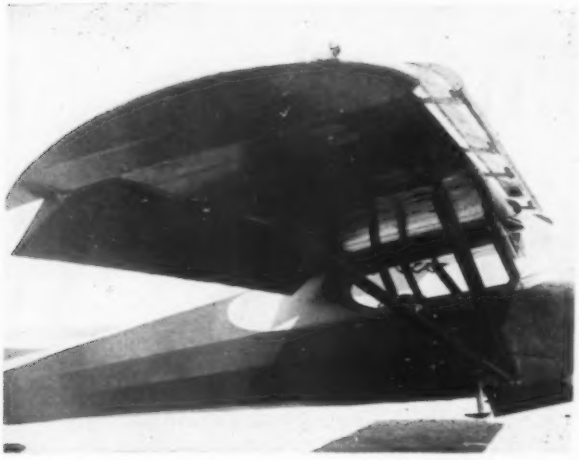
'Hush Box.' A new powerplant arrangement provides the unusually low noise level of the Helioplane. Principal unit in the design is the "hush box" or muffler patented by Koppen over five years ago. It is superior to other mufflers in that it does not incorporate a maze of passages or compartmentation which, in lowering noise, raise engine back pressures and present maintenance problems.

Koppen's "hush box" is a simple, unobstructed expansion chamber using the air pump principle of exhaust gas ejection, such as now used on the Convair Liner. That is, the exhaust gases of the 85 hp Continental engine are discharged through a venturi-like opening in such a manner as to control air flow. The discharged gases pass through the insulated duct section and overboard. The entire unit is about 3 feet long and 9 inches in diameter. It is mounted under the fuselage between the landing gear.

The landing gear has been moved considerably forward as compared to conventional design practice. The airplane is designed to make a three point landing and the center of gravity and lift characteristics are such that it is virtually impossible to land with the nose down. In addition to incorporating the Goodyear cross-wind landing gear, the Helioplane also uses pneumatic-oleos for shock absorption, although operational characteristics do not require this improved design.

Use Own Funds. After failing to in-

IN ONE OF ITS EARLY FLIGHTS, the Helioplane demonstrates it can take off at 18-degree angle of climb. The craft made its first flight on April 8.



CLOSE-UP VIEW OF SLATS AND FLAPS of the Helioplane are shown on the left, while on the right, Dr. Otto C. Koppen and Dr. Lynn Bollinger examine leading edge slats.

terest CAA, NACA, or military authorities in financing development of the first Helioplane, Koppen and Lynn Bollinger, of the Harvard Business School, decided to produce the airplane with their own funds. They started with a Piper Vagabond but during modification the plane took on an entirely new configuration. The wing span was reduced by 9 inches, the fuselage lengthened by 45 inches, an additional cabin door was added, the rudder redesigned, gear moved forward and slats incorporated in the wing leading edge.

Although aerodynamically operated slats are not new, practical applications of this principle, which alters the air flow over the wing leading-edge to provide optimum lift characteristics, have been almost non-existent. In numerous flights since April 8 of this year, the Koppen approach to this problem has proven itself entirely practical. The angle of incidence of the wing is novel in that, at speeds as low as 30 mhp, the wing is 14 degrees from its stall angle.

Bollinger, who laid out the specification for the Helioplane, explains that the next step is in obtaining CAA certification. He foresees difficulties in obtaining acceptance of some of the advanced features but is confident of final approval. Meanwhile the Helio Corp., Norwood, Mass., is seeking to get an aircraft manufacturing firm interested in producing the aircraft under license. Fairchild is known to be discussing the project with the designers and other companies have expressed interest.

As soon as minor changes now being programmed are completed, the Helio Corp. expects to produce between six and 12 airplanes for use by a limited number of agencies for evaluation purposes. These models will probably be manufactured in the hangars of E. W. Wiggins at Norwood, Mass., where the first airplane was engineered and is now under going modification. Most of the basic work on the Helioplane was done by mechanics at Wiggins who shared in the development risks on a "double or nothing" basis.

Introduction of the Helioplane marks a milestone in the history of light aircraft design. It may provide the "shot-in-the-arm" needed by the personal aircraft industry, which has been losing ground for some time. In February of 1949 2,700 student pilot certificates were issued compared to 10,000 in February last year. There's a lot of ground to be gained but with feeder type airline service, the distant possibility of Air Star Routes to provide incentive, and an airplane like the Helioplane to point the way, the future shows promise.

UNUSUAL FEATURE which contributes to the Helioplane's performance characteristics is the split rudder shown here. Lower part of the rudder is interconnected to the aileron control and moves independently of rudder pedal action. Upper part operates conventionally from rudder control pedals.

N. Y. Zoning Amendment Favors Small Airports

Personal flying would get a break under a zoning amendment adopted a fortnight ago by the City Planning Commission of New York. The amendment, which is subject to approval by the Board of Estimates, would limit to 30 feet the height of new buildings within half a mile of the boundaries of private airports.

Proponents held that the amendment was needed to clarify and extend airport regulations under the zoning laws. The change would cover applications for new fields or for extensions to existing ones.

Park Commissioner Robert Moses filed a minority report assailing the new restrictions as "a direct infringement on the rights of property owners".

Under the amendment, the city's planners are empowered also to rule on plans and field layouts, including runways, for all future private airports and seaplane bases in the city.

All-Weather Tests For Lightplanes?

Sponsorship of an all-weather experiment for light aircraft is being considered by the Civil Aeronautics Administration. Purpose would be to compile data on everyday operation of light planes under all types of adverse conditions, including the functioning of standard instrument equipment.

Under one plan, the program would be carried out simultaneously in three locations to gain experience in a cross-section of climatic conditions, in New England, Texas, and California. The planes would be shuttled daily between two cities in each section regardless of weather.

The Flight Safety Foundation is being considered to conduct the operation.

Private Capital in PUBLIC SERVICE

• In the United States air transportation is operated as a private enterprise. In other countries it is conducted by the government. The United States continues to lead, as it always has, in the development and utilization of air transportation. No other country has a comparable standard of airline service. We believe it is to the nation's interest, as well as to our own, to continue to operate under the system that made this possible.

If, however, private enterprise is to retain the spirit and initiative which makes for progress, it must be convinced that its service is useful and that results are largely dependent on its own effort. A result of our effort is:

In three years, 1946, 1947 and 1948, American Airlines, Inc. invested $60,000,000 in new airplanes and equipment:

This provided business for the aircraft factories and employment for their men, strengthening *their* ability to contribute to national air power.

It provided one hundred twenty-five airplanes of the most modern design—the largest single fleet of modern transport aircraft in the world, and a direct contribution to national air power.

It provided a new 300-mile-an-hour fleet for the air routes of the United States, assuring time-saving, dependability and safety—more comfort for the passenger and greater speed for all forms of travel, transportation and communication.

In the same three years, American Airlines, Inc. invested $6,000,000 in new and more efficient shop buildings and equipment:

This has provided jobs for trained technicians and modern machinery for their use.

It, thereby, provides an important reserve of skilled personnel available for national air power.

It has provided operating economies which will be reflected in contribution to profitable operation and, ultimately to reduction in charges for air transportation.

It has provided maintenance and overhaul facilities, strategically located, which constitute a reserve for national air power.

Every dollar of the $66,000,000 came from private investors. None of it was borrowed from any agency of the government nor was any of it government subsidy.

AMERICAN AIRLINES INC.

What Air Mail Subsidy?

A common misconception is that all of the airlines are supported by government subsidy. Let's discuss this:

American Airlines is paid for the transportation of mail at rates established by order of the Civil Aeronautics Board. The rate at which American is being paid was certified by the Board to be "fair and reasonable in terms of quality of service and was not designed to meet the financial needs of the carrier." That rate includes no subsidy.

The United States Post Office Department is American Airlines' largest customer in dollar volume, and we continue to give it the best of service.

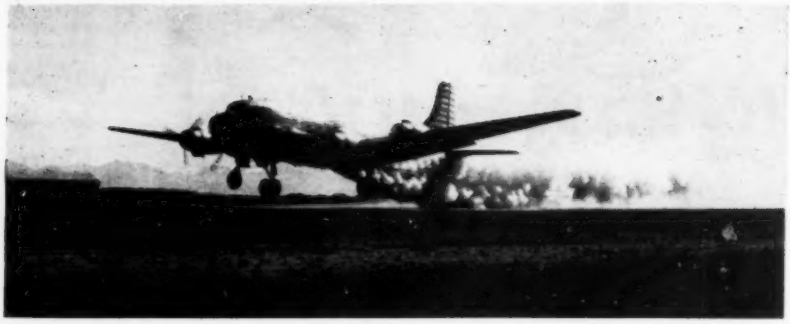
It should be remembered also that we transport passengers, express and freight. In 1948, our revenue from those sources was $84,615,000. Our total revenue for the transportation of mail was $4,769,000.

Of the total revenue of American Airlines in 1948 more than ninety-four per cent (94%) came from the transportation of passengers, express and freight. Less than six per cent (6%) came from the transportation of mail.

If, during 1948, the total revenues received for the transportation of mail, $4,769,000, had been the only funds available to meet our expenses we would have been able to operate only 19 days during the year. We did operate 365 days.

American Airlines is a business institution. We take pride in the fact that we have been able to make substantial progress and improvement, with private capital usefully employed in the public's service.

AMERICAN AIRLINES INC.



Assisted Take-Off—Braniff's DC-4 is shown taking off from the world's highest airport at La Paz, Bolivia. Located 13,398 feet above sea level, La Paz provides special problems because the low air density reduces normal performance standards. Working with the Aerojet Corp., a subsidiary of General Tire and Rubber, Braniff equipped its DC-4's with four JATO motors which provide extra power to enable additional safety margin at this high altitude and permit the use of higher gross take-off weights.

Braniff Using JATO on Bolivia Flights

Following five months of extensive testing, Braniff International Airways will inaugurate the first commercial use of JATO (jet assisted take-offs) at La Paz, Boliva on June 3. Located at 13,398 feet above sea level, La Paz Airport is the highest field in the world. Braniff has been operating DC-3's into La Paz on a route between Lima and that city since February but has delayed the inauguration of DC-4 service until completion of these tests.

Braniff's DC-4's will be equipped with four JATO motors manufactured by Aerojet Corp. Two units are mounted on the underside of each wing at the point where the wing and fuselage meet. A simple switch mechanism in the cockpit enables the pilot to activate the motors which produce a combined jet stream equivalent to the power of a 1200 horsepower engine. Although the standard DC-4 can operate safely out of La Paz, the JATO motors will provide increased safety and permit the use of higher gross take off weights at this altitude.

Although more than 25,000 military installations of JATO were used, this will represent the first time a scheduled commercial airline has used the system. American Airlines had conducted tests along this same line in the early post-war period.

The system is particularly desirable for applications of this type at La Paz because it is a true rocket unit carrying its own fuel and oxygen. This self-contained feature, combined with the fact that jet reaction is independent of air density, provides rated power at altitude as required by this operation.

Test Group—These are some of the men responsible for CAA's approval of JATO for the first scheduled commercial operation. They are, left to right, front row: Harry Turnpaugh, maintenance agent, CAA at Dallas; Dan Hughes, Braniff's chief pilot; Cliff Younie, chief of Braniff's engineering department; R. V. Carleton, director of flight operation, Braniff; M. L. Cunningham, director of flight operations for CAA's fourth region at Fort Worth; E. E. Nelson, chief of engineering and sales for Aerojet. Second row: left to right (only first three identified) Henry Fowler, CAA flight engineering; Kenny Mathews, Braniff mechanic, and Paul Boake, CAA engineer.

27 Airlines Receive Safety Awards

The National Safety Council has named 27 U. S. domestic and overseas air carriers as winners of its 1948 aviation safety awards. The 27 carriers, flying scheduled runs, completed more than four billion passenger miles without fatality last year.

American Airlines set a new all-time record when it ended 1948 with a total of 2,933,272,000 passenger miles since its last fatal accident on Dec. 28, 1946. Other billion-mile award winners were TWA, with 2,144,168,000 passenger miles since Mar. 11, 1947, and Braniff, with 1,112,599,000 passenger miles since its last fatality on Mar. 26, 1939.

Although American holds the passenger mile record, Hawaiian Airlines added 1948 to its record for consecutive years of safe flying. It has never had an accident since establishment on Nov. 11, 1929—a period of 19 years and two months.

Special citations went to Northeast Airlines, which passed its 15th anniversary without a fatal accident, and Pan American-Grace Airways, honored for five years and 523,422,000 passenger miles since its last fatality on Jan. 22, 1943.

Six accidents in domestic and overseas operations took a toll of 103 passengers and 23 crew members to mar the year's safety record. Even so, the rate of 1.3 deaths per 100 million passenger miles was one of the best in airline history.

Award winners, in addition to American, TWA, Northeast, Hawaiian and Panagra, were:

	Safe Miles Flown (in millions)	Date of Last Fatal Accident
American Overeas	389	Oct. 3, 1946
Capital	459.2	June 13, 1947
Chicago & Southern	671.3	Aug. 5, 1936
Colonial	234.8	Apr. 18, 1930
Continental	325	May 1, 1935
Inland	128.9	None
Mid-Continent	380.4	Nov. 15, 1934
National	475.2	Oct. 5, 1945
Uraba, Medellin & Central	10.3	None
Western	285.9	Dec. 24, 1946
Caribbean-Atlantic	18.1	None
Challenger	9.3	None
Empire	9	None
Florida	2.9	None
Monarch	12.9	None
Piedmont	9.8	None
Pioneer	52.5	None
Southwest	35.3	None
Trans-Texas	6.7	None
West Coast	14.3	None
Wisconsin Central	2.2	None

Speed Record

Harold E. Thompson of Sikorsky Aircraft Division of United Aircraft Corp. on May 6 set an international speed record for helicopters, flying a 100-kilometer closed-circuit course at an average speed of 122.75 mph. No previous record had ben filed for this distance. Thompson had set a new three-kilometer record of 129.616 mph at Cleveland on Apr. 27, flying the same aircraft, a Sikorsky S-52-1.

Bright Prospects for Airlines:

Cost and Traffic Trends Offer Big Profit Potential

The major U. S. airlines are in a fair way toward making substantial profits this year—if the trend toward controlling costs continues and if traffic continues good. This was the forecast of Fred V. Gardner, a consultant of Milwaukee, and a director of Wisconsin Central Airlines, before the Senate committee investigating airline finances.

Gardner presented a detailed forecast for eight of the major companies and said the industry total profit for 1949 (excluding international) would amount to $57,607,000 if load factors for the various carriers ranged between 60% and 72% as shown in the accompanying table.

But Gardner was quite critical of some carriers for not reducing costs sufficiently. He believes the airlines are potentially great profit producers if they will only tackle their cost problems more carefully and begin to branch out into the lower-fare market. He praised Capital Airlines very heavily for performing a near-miracle on costs in the past two years, and said TWA was making favorable strides in the same direction.

Standby vs. Variable Costs. A consultant who has worked with General Electric, U. S. Steel and other firms, Gardner has developed his own concept of determining breakeven points. He segregates what he terms "standby" costs from variable costs and says the airline industry must follow this method before it begins to understand its own business. A standby cost is a cost which exists regardless of the volume of business, he explains, while a variable cost is controllable.

"Using standby and variable costs," he said, "our investigation would disclose that it takes about 160 million dollars for standby expenses to operate the present overall domestic airline system of the U. S. This is made up of a standby of slightly under $138 million for the eight major airlines, $15 million for the miscellaneous 'major' airlines, and $7 million in the group of companies known as feeder airlines.

"This is the amount of money which, in our opinion, based on an investigation of the performance of the airlines up to the point, does not and will not vary with changes, in ton-miles, available seat miles, or miles flown. In addition to this, our analysis indicates that it requires a variable expense of 80c for every revenue mile flown by these major lines and 53c for each mile flown by the feeder lines."

Standby costs, he said, include capital expenditures, the construction, manning and equipping of ticket offices, depreciation charges, etc.

One Way to Save. "If consolidation and unification of services could eliminate even 10% of the standby costs, it would create a saving of over $15 million in the airline industry each year. And we feel that such savings are not beyond the realm of practicality; cold, hard facts prove this can be done.

"The performance of some airlines within the past year or two has pointed up what can be done voluntarily. Capital Airlines, for instance, since December, 1946, has reduced its traffic department personnel from 1,367 people to 536, yet confidently expects to produce almost 25% more business this year than it did two years ago. And this is not just an isolated case.

"Other companies have not shown this sort of improvement. For instance, United Air Lines had a yearly standby of $4 million before the war. Now, their standby per year is over $28 million—greater by almost 50% than its entire revenue 10 years ago. And only $8 million of this increase is depreciation.

"The variable control is the crux of what is happening in day-by-day performance. Capital operates at a variable cost of only 62c per mile, whereas on the other hand, Northwest, operating about the same number of route miles, under somewhat similar conditions, requires 97c per mile to operate. All of these costs are based on domestic operations only, and variable costs in our study are based on revenue plane-miles flown.

Better Control Needed. "Since the standby costs have been eliminated, the variable costs of these airlines are directly comparable, qualified somewhat by the kinds of varieties of equipment used. We believe that much can be done by the individual management in profit pickups in the airlines in 1949 by a better control of their variable costs. We do, however, believe that this will be impossible unless they are willing to segregate these so-called variable costs from the standby costs, which require an entirely different concept and treatment by management."

Gardner said a quick calculation of various industry costs in 1948 shows that the 16 major domestic airlines flew 317 million revenue plane miles at a total cost of $414.2 million. Since the standby expenses are approximately $152.7 million, the remaining cost, or $261.5 million, was variable expense. Allocating this variable cost over the miles flown, it is found that roughly 82½c is required in variable expense to fly the planes one revenue mile.

Here is how Gardner compared the

1949 Profit and Loss Forecast
Major Domestic Airlines

(000 omitted)

Company	Estimated no. miles to be flown	Passenger Load Factor	1948 Load Factor	Available Seats Per Mile—1948	Revenue Per Mile
American	55,500	72%	61%	38.2	$1.836
Eastern	49,400	70	59	33.2	1.502
Northwest	16,850	65	56	34.3	1.419
Capital	17,800	65	49	32.2	1.506
United	57,600	73	65	30.8	1.434
TWA	54,500	65	58	27.1	1.188
National	7,200	60	38	41.5	1.694
Braniff	11,100	60	54	31.6	1.307
Others	50,000	60	58	24.7	1.162
Totals	319,950	67.7%	58.5%		$1.434

Company	Total 1949 Revenue	Operating Costs: Standby	Variable	Total	Profits Before Taxes
American	$101,898	$ 42,000	$ 43,290	$ 85,290	$16,608
Eastern	74,199	19,500	40,261	59,761	14,438
Northwest	23,910	9,600	16,345	25,945	2,035 (Deficit)
Capital	26,807	10,800	11,036	21,836	4,971
United	82,598	28,200	45,708	73,908	8,690
TWA	64,637	18,000	40,330	58,330	6,307
National	12,197	4,800	4,895	9,696	2,501
Braniff	14,508	4,800	7,681	12,481	2,027
Others	58,100	15,000	39,000	54,000	4,100
Totals	$458,854	$152,700	$248,547	$401,247	$57,607

Passenger revenues in the above table were based on average revenue per passenger mile as follows: American, 5.80c; Eastern, 6c; Northwest, 5.65c; Capital, 5.60c; United, 5.50c; TWA, 5.60c; National, 6c; Braniff, 5.40c; others, 6c.

Depreciation in the costs in the above table was as follows: American, $11.6 million; Eastern, $6.9 million; Northwest, $4.2 million; Capital, $2.0 million; TWA, $5.3 million; United, $9.9 million; National, $1.3 million; Braniff, $1.1 million. Others, $6. million.

airlines with variable rates per mile:

Better than average:	
Capital	$0.62
National	.68
Braniff	.692
TWA	.74
Average:	
American	$0.78
Eastern	.815
Other 'Majors'	.78
Poor Day-by-Day Performance:	
United	$0.83
Northwest	.97

"Capital has a 62c variable rate today because it was driven there by necessity," he said. "Two years ago its variable rate per plane mile was 70c. It has been only a matter of two years ago when the annual statement of Capital showed the current assets and the fixed assets added together because the working capital deficiency was so great that it was not desired to call it to the direct attention of the stockholders.

"From this pathetic condition, Capital, through necessity, the shortage of working capital, a desire for survival, and all the other ramifications which go into 'must' management, has brought its cost per mile of operating its airline down to a point that's almost unbelievably low.

"In the same way, National Airlines, which recently had a strike, now has perhaps the lowest breakeven point in the industry. Why? Because during the strike it could appraise its standby costs in relation to 'no volume' in a very acute way. That, coupled with its low variable cost per mile which was adjusted by the fact that it started from scratch when it began operations again, created an extremely low breakeven point for the company.

High Potential. "The profit potentials of the airline industry are extremely great. Because of its high standby expenses it requires a slightly higher load factor than it realized last year. However, above the breakeven point, most of the airlines will earn anywhere from 50c to one dollar for each additional mile, operating on the current cost trend.

"Considering the fact that, with the exception of Northwest Airlines, most of the lines were close enough to their breakeven points in 1948 that a 1% or 2% increase in passenger load factor would have pushed them into the black ink, the problem is not as insurmountable as it might appear. The process of shifting from a loss to a profit can happen very rapidly, and the resulting profit because of increased load factor can multiply immensely."

RFC Loan for AAA

An $800,000 loan from the Reconstruction Finance Corporation to All American Airways was approved last month by the Civil Aeronautics Board. The loan is to mature on or before Dec. 31, 1950, with interest at 4% per annum.

Good Financial 2nd Quarter Seen for Domestic Airlines

With an aggregate net loss of $6,969,000 on the first quarter's operations, and with all signs pointing to a record second quarter, the domestic trunk airlines this month had expectations of going into the second half of 1949 with less red ink on their ledgers than at the mid-year mark in any year since the war.

Actually, five of the 16 trunklines showed a net profit for the first three months of this year, and the aggregate loss for the group was less than half the 1948 first-quarter loss of $14,380,000 (unadjusted as to subsequent retroactive mail pay awards).

There were several impressive features about the revenue and expense reports for the year's initial quarter, but perhaps the most encouraging was the fact that operating revenues, as compared to the same quarter of 1948, had increased at more than twice the rate at which operating expenses had climbed.

Total operating revenues for the quarter were $98,871,000, compared to an unadjusted total of $78,608,000, an increase of 25.7%, whereas operating expenses increased by 12.1%—from $92,504,000 to $103,760,000. Passenger revenues alone were up from $65,596,000 in last year's first quarter to $79,851,000 in the same period this year.

Mail revenues of the 16 trunklines for the first quarter of last year totaled $6,647,000, prior to adjustment. What they were after adjustment, not even the CAB could say as of last week, but the probabilities were that the increased mail pay retroactive to that quarter would not boost the total above $10,000,000. if that high. Mail revenues for the first quarter of this year added up to $11,138,000.

Air express revenues for the quarter were down from $2,439,000 to $2,062,000, but air freight income was 50% higher than in the comparable 1948 quarter—$4,919,000 as against $2,642,000.

April Profit for Capital

Capital Airlines had a net profit of $163,949 for the month of April, exclusive of profits earned on the purchase of debentures for the company's sinking fund operation. Counting these, the adjusted net profit for the month would have been $921,051. Net working capital and cash balances of the company increased over the preceding month, and the total debenture debt declined by $2,165,000.

NWA Nets $367,149

Northwest Airlines' net profit for April was $367,149, as contrasted to net loss of $343,649 for April, 1948. Gross revenues were up $780,000 while expenses increased only $28,202. For the first third of 1949, losses amounted to $1,115,821, compared to an unadjusted loss of $2,187,432 for the same period of 1948.

First Quarter Financial Results For Domestic Airlines

(000 omitted)

Carrier	Total Operating Revenues	Passenger Revenues	Mail Revenues	Express Revenues	Freight Revenues	Total Operating Expenses	Net Profit or Loss
American	$20,634	$17,305	$ 1,378	$ 401	$1,244	$20,891	–$326
Braniff	3,079	2,366	553	62	52	3,446	–178
Capital	5,480	3,318	1,511	124	317	5,834	–499
C & S	1,817	1,305	423	43	27	1,896	–84
Colonial	844	557	269	4	8	950	–120
Continental	1,104	700	336	8	17	1,350	–170
Delta	4,062	3,446	413	52	76	3,739	238
Eastern	19,231	17,231	887	300	420	16,173	1,733
Inland	550	364	170	6	6	508	26
MCA	1,655	1,217	385	16	17	1,662	2
National	3,797	3,248	350	43	70	3,080	689
Northeast	1,028	649	349	8	15	1,220	–196
Northwest	4,438	3,375	675	122	214	5,830	–1,530
TWA	12,642	10,129	1,434	361	459	15,294	–2,963
United	16,624	13,315	1,547	492	952	19,807	–3,436
Western	1,886	1,326	458	20	25	2,080	–155
Totals—1949	**$98,871**	**$79,851**	**$11,138**	**$2,062**	**$3,919**	**$103,760**	**–$ 6,969**
1st Quarter '48	**$78,608**	**$65,596**	**$ 6,647***	**$2,439**	**$2,642**	**$92,504**	**–$14,380***

* Not adjusted to reflect subsequent mail pay awards.

AOA-PAA Merger Would Reduce Subsidy, Smith Says

The proposed merger of American Overseas Airlines and Pan American Airways would provide "a logical pattern of strong two-carrier competition between the United States and Europe in place of the present pattern where three carriers are becoming increasingly dependent upon subsidy," C. R. Smith, president of American Airlines, declared during hearings on the case before CAB last week.

"We don't like the basis of subsidy," Smith said, in answer to questions as to why American Airlines believes it advisable to sell its subsidiary AOA to PAA. He stated that the proposed transfer is wholly consistent with American's strong opposition to the "chosen instrument" theory advanced by PAA.

Smith brought out that: (1) that a minority on AA's board of directors have for some time felt the investment in AOA doubtful; (2) that in his opinion the merger with AOA obviously lessens PAA's chances of getting a transcontinental domestic route; (3) that the merger agreement contemplates no preferential treatment in routing international passengers over domestic airlines;

(4) that American, although it may become PAA's largest stockholder, does not need nor want representation on the board of directors and intends to exercise no influence over PAA affairs; (5) that American would object to CAB action making AA's block of PAA shares non-voting; (6) that in Smith's view the AOA-PAA merger would make a less strong competitor for the remaining carrier than would a TWA-PAA merger;

(7) that AA has no present thinking on what it will do if CAB and the President haven't passed on the merger when the contract expires in September; (8) that Smith wishes John Slater of American Export Lines were still chairman of AOA's board because "his judgment is one of the best I've ever found on any business problem"; (9) that he had approached Noah Dietrich, Hughes Tool Co. official, in May or June of 1948 to discuss possible merger of AOA and TWA, but that nothing had come of two conversations.

Scheduled Lines Fight Air Freight Decision

With 13 parties to the case filing exceptions to CAB's tentative decision in the Air Freight Case, the stage was set last fortnight for another round in this lengthy proceeding.

Spearheaded by the Air Transport Association and eight major scheduled carriers, most of the protesters held that CAB had erred grievously in awarding certificates to Slick Airways and The Flying Tiger Line for operation of transcontinental all-cargo services and to U. S. Airlines for a similar north-south service.

"It would seem," said Eastern Air Lines, "that the Board's recent bitter experience of temporizing with irregular and improvident grants of authority would have brought home to it the utter folly of indulgence of such applications as are under consideration here."

The scheduled airlines took exception to the Board's estimate of cargo potential of one billion ton miles annually, declaring this to be based upon "chimerical projections."

. Willis Fights Back. Charles Willis, Jr., received a sympathetic hearing from the Senate Interstate and Foreign Commerce Committee on May 20, when he protested certification of U. S. Airlines, instead of Willis Air Service, Inc., for the north-south cargo route.

He told how his company had built up the highest load factor in the air freight industry last year and had actually shown a net profit of $24,881 for the year. As for U. S. Airlines, it stopped operating to conserve its resources, reduced to $400,000 out of $2,500,000 raised in a public stock offering in 1946, Willis declared.

Earlier in a letter to CAB, Willis had charged that in three years and seven months it had lost only $20,000 in air freight operations, compared to U. S.'s loss of over $2.6 millions in less than three years.

Stratocruisers Over NAL Route In Interchange Deal

Operation of Boeing Stratocruisers over National Airlines' Miami-New York route for at least one round-trip daily is one of the many proposals in the interchange agreement the Civil Aeronautics Board has been asked to approve between National, Pan American Airways and Pan American-Grace Airways.

The interchange agreements, as outlined in documents filed with the Board, call for operation of Panagra planes and flight crews over National's Route 31 from Miami to New York with possible stops at Washington and other intermediate points, and for NAL's operation with PAA aircraft, including Stratocruisers, of local flights on Route 31. National's directors formally approved the agreements May 19.

In both instances, the planes would be operated north from Miami under charter to National, with the latter having full responsibility for operations over its routes. In general, there will be a division of revenues in the same way that revenues from a connecting service are divided. The rental rate which NAL will pay for using PAA and Panagra planes is still under negotiation. A per-mile rental rate is contemplated.

AOC Officers, Directors—Officers and directors of the Airport Operators Council chosen at the recent annual meeting in Denver are, left to right: (seated), A. B. Curry, first vice president (Miami); B. M. Doolin, president (San Francisco); J. Victor Dallin, director (Philadelphia). Standing: Cyril C. Thompson, executive secretary (Washington, D. C.); Hervey Law, director (New York); Charles J. Lowen, second vice president (Denver); John Berry, director (Cleveland); Leander I. Shelley, general counsel (New York).

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CAB Briefs

(Route, Mail Rate and Other Actions of Civil Aeronautics Board)

Route Cases

The proposed southern transcontinental interchange between **American Airlines** and **Delta Air Lines** has been recommended by CAB Examiner J. Earl Cox for temporary approval extending from date of CAB action until 60 days after final decision in the Southern Transcontinental Case. Permanent approval of the interchange is an issue in the latter case.

Cox held that the agreement would enable the two carriers to improve aircraft utilization and effect other savings, that it would offer improved service to some 38,000 passengers annually, and that there would be no serious diversion from other carriers.

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United Air Lines opposes establishment of a southern transcontinental carrier because of the relatively light traffic volume to be served and the "extraordinarily great amount" of competition such service would entail, Harold Crary, UAL's v.p.-traffic and sales, testified at hearings in Southern Transcontinental Route Case, May 20. Previously, E. V. Rickenbacker, **Eastern Air Lines'** president, declared that EAL "is firmly convinced that nothing less than a direct one-carrier Southern Transcontinental route, as proposed by Eastern can meet the public needs." Rickenbacker said that the recent EAL-National interchange agreement had never been advanced as a substitute for the direct one-carrier service.

The CAB, which rarely issues statements on orders denying motions, decided to issue one in connection with its denial of a motion of **Trans-Texas Airways** asking it to rescind its proposal to terminate the company's temporary certificate on May 13, 1950. The release said, in part:

"Trans-Texas will have a full opportunity to present its case for the continuance of its certificate in public hearings which will start in the fall of this year. At the time of the hearing, Trans-Texas will be able to submit traffic and financial results based on nearly two years of operating experience, and to demonstrate errors in the Board's tentative conclusions."

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CAB Examiner Curtis C. Henderson, who conducted the hearing with regard to the proposed extension of **Empire Air Lines'** feeder certificate beyond the September 27 expiration date, has recommended that the life of the certificate be extended to December 31, 1950.

•

Mid-Continent Airlines and **Parks Air Lines** have asked CAB approval of an agreement whereby MCA will acquire 100% control of Parks through exchange of stock. Expeditious handling was requested to permit the beginning of operations over Parks' route before July 1.

Exemptions

Two non-certificated carriers, **The Flying Tiger Line** and **Trans-Caribbean Air Cargo Lines**, have been granted special exemptions to operate a total of five trips this summer carrying students to Rome, Italy, and Tel Aviv, Israel.

In issuing the exemptions, first granted to non-certificated carriers for transportation of passengers in international operations, CAB pointed out that it would consider on their merits requests for similar exemptions filed by other carriers who were engaged by recognized religious, educational and charitable groups for trans-Atlantic charter travel this summer.

Cargo

Without ruling on the basic question of whether its rate floors are applicable to freight forwarders and large irregular carriers, the CAB two weeks ago dismissed a complaint of **American Airlines** against below-minimum transcontinental rates filed by Domestic Air Express, an authorized forwarder.

The forwarder's rates undercut American and other direct carriers by $5.55 on a 500-lb. shipment, and the forwarder holds an additional 60c per hundredweight rate advantage by virtue of its free pickup service for cut flowers originating in Los Angeles. American, in protesting the tariff, asked CAB to amend Sec. 292.6 of the Economic Regulations to make forwarders and others subject to minimum rate orders, heretofore applicable only to direct air carriers. CAB temporarily ducked the issue.

Mail Rates

New final mail rates established for **Western Air Lines** and **Inland Air Lines**, effective from Jan. 1, 1949, are expected to yield Western about $1,594,000 annually and Inland approximately $610,000 annually. Final rates for the period prior to last Jan. 1 have been held up pending a hearing on certain disputed items.

Western's new rate is a sliding-scale formula which will allow a maximum base rate of 33c per revenue plane mile when the passenger load factor is under 55%, based on 21-seat DC-3's, 40-seat Convairs or 50-seat DC-4's, with the mail rate going down 1.40c for each 1% increase in load factor above 54% to a minimum of 8.40c at a 72% load factor. Inland's rate is 34.20c per plane mile when passenger load factor is below 51%, dropping 0.80c with each 1% increase in load factor to a minimum base rate of 7.50c per revenue plane mile at an 84% load factor.

CAB CALENDAR

June 14—Hearing on applications of Val-Air Lines and Trans-Texas Airways proposing Service to points in Texas. (Dockets 3645, 3646 and 3367). Tentative. Examiner R. Vernon Radcliffe.

June 15—Hearing on application of Linea Aeropostal Venezolana (LAV) for a Venezuela-Havana-Miami-New York-Montreal Foreign Air Carrier Permit. (Docket 3751). Tentative. Examiner Richard A. Walsh.

June 20—Hearing on application of Purdue Aeronautics Corporation for Lafayette, Ind.-Chicago Route. (Docket 3713). Tentative. Examiner Richard A. Walsh.

June 20—Hearing on extension of term of Southwest Airways Certificate and proposed suspension of certain United Air Lines points. (Docket 3718). Tentative. Examiner Paul N. Pfieffer.

June 20—Hearing on application of CARGO Air Service for an Albuquerque-Santa Fe-Los Alamos, N. Mex., Route. (Docket 3629). Tentative. Examiner Joseph F. Fitzmaurice.

Aviation Calendar

June 1-4—Aviation Writers Association convention, Statler Hotel, Washington.

June 3-12—Michigan Aviation Week. (Auspices Aero Club of Michigan, Book Bldg., Detroit).

June 4-5—Third Annual All-Woman Air Show, Miami, Fla.

June 4-5—Fourth Annual Air Fair & Industrial Exposition, Shawnee, Oklahoma.

June 9-11—Institute of Navigation annual meeting. Carvel Hall, Annapolis, Md.

June 16-17—Aviation Distributors and Manufacturers Association officers, directors, Broadmoor Hotel, Colorado Springs.

June 17-18—Fourth Annual Ohio Aviation Clinic, Bowling Green State University.

June 18—Third Annual Air Show, Anchorage, Alaska.

June 19—Walla Walla, Wash., Air Fair.

June 19-26—Colorado Aviation Week with exhibit of planes, Stapleton Field, Denver.

June 23-25—California Association of Airport Executives convention, San Francisco.

June 26-28—National Aeronautic Association annual convention, Akron, Ohio.

July 1-4—Air Force Association annual convention, Chicago.

July 1-4—National Air Fair, Orchard Airport, Chicago.

July 2-10—16th National Soaring Contest, Elmira, N. Y.

July 10-13—National Ass'n. of University Administrators of Aviation Education annual meeting, Kent State Univ., Kent, Ohio.

July 19-21—NASAO Board of Directors, Grand Hotel, Mackinac Island, Mich.

July 20-21—I.A.S. Annual Summer meeting, I.A.S. Bldg., Los Angeles.

Aug. 25-28—National Flying Farmers convention, Ft. Collins, Colo.

Aug. 26-29—Airlines Medical Directors Association 7th annual meeting, Hotel Statler, New York.

International

June 1—ICAO Subcommittee meeting on Revision of Warsaw Convention, Montreal.

June 1—ICAO Subcommittee meeting on Revision of Rome Convention and Brussels Protocol, Montreal.

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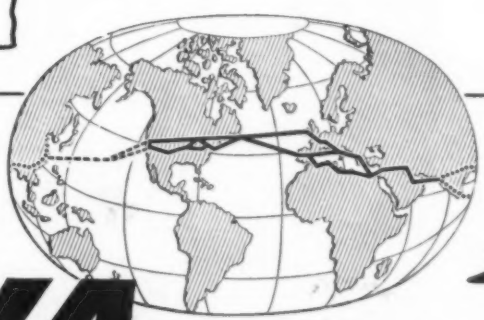

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Between the Lines

By James J. Haggerty, Jr.

How to Test the B-36

Last week Rep. Carl Vinson (D., Ga.) and his House Armed Services Committee, weary of the interminable controversy about whether the six-engine Convair B-36 bomber is "invulnerable" to jet fighter attack above 40,000 ft., decided to find out, and forthwith unanimously adopted a resolution calling for an investigation of the big bomber's capabilities.

The resolution was brought about by Navy claims that its fighter aircraft can intercept and "kill" the B-36, despite the fact that the Air Force claims its own fighters (Republic F-84, Lockheed F-80 and North American F-86) have all sorts of trouble in interceptions above 40,000 ft.

We are all for the interception tests, and we have repeatedly stated in these columns that the taxpayer is entitled to know whether this airplane, which acts of Congress and the Defense Secretary have made our first line of defense, is capable of handling its assignments. However, we think that Mr. Vinson has oversimplified the problem in demanding only a series of interception tests.

Basic Issue. The question of the worth of the B-36 should not be reduced to whether it can elude fighters at 40,000 ft. The basic question is this: Can it, as the Air Force claims, take off from bases in North America, fly to a Russian target with an effective bomb load, and return to its North American base? And can this be accomplished with reasonable expectancy of return?

We say reasonable expectancy of return because we do not think that invulnerability is a requisite characteristic of any plane. To the best of our knowledge we have never had an invulnerable bomber. Certainly no one can say that the Boeing B-17's and Convair B-24's of the last war were invulnerable, yet they did a pretty fair job in Europe.

Let's plot a hypothetical mission and see what would be required of the B-36. Let's take for our target the industrial city of Kuibyshev, an aircraft and engine manufacturing center which should certainly rank high on the Air Force list of 70 Russian targets. Kuibyshev is located on the western side of the Urals and is ideal for our hypothesis since it is neither the nearest nor the farthest of the Russian targets we would have to hit.

For our North American base we'll select Newfoundland. The distance from Newfoundland to Kuibyshev is about 3,500 miles. Since Kuibyshev is about 1,000 miles inside the perimeter of Russian air-defended territory, the B-36 will be able to fly five-sevenths of its round trip mission over undefended territory.

However, we can also assume that the 1,000 miles between the perimeter of defended territory and the target will be pretty hot ones—so the B-36 will have to reach 40,000 ft. or better by the time it reaches that perimeter, and stay there for 2,000 miles, or roughly six hours. We can also assume, based on experience in Europe in World War II, that the Russians will have fighter defense belts every 200 miles. Therefore, the B-36 will be subjected not to a couple of quick passes, but to sustained fighter attack through five defense belts and the target area.

Not Defenseless. Let's remember, too, that the B-36 is not completely defenseless. In the first place, the new strategy in long-range bombing differs somewhat from that of World War II. In a B-36 group, for instance, not all the planes would carry bombs—some would carry some very efficient radar jamming devices about which very little has been revealed.

Since it is next to impossible to locate a bomber flying above 40,000 ft., particularly at night, without radar assistance, this jamming apparatus can play a very important part. Also, let's remember that it carries 20 mm. armament, the effective range of which is some 200 yds. better than that of the fighters.

In consideration of the above here's how we think these tests should be run. The Navy should be assigned three targets, each located about 1,000 miles from the perimeter of defended territory, and should be provided with radar equipment with which to guard its territory. It should set up fighter defenses at 200-mile intervals inside the perimeter of defended territory.

The Air Force should then be allowed to bomb any one of the three targets it chooses (to simulate the normal surprise element) at any time it sees fit, night or day, fair weather or foul. The Air Force should take off it's B-36's at gross weights of not less than 328,000 lbs., which is normal for long range missions, and fly for approximately 2,500 miles before entering the defended area. The B-36 group may be in any proportion of bomb-carrying and radar jamming planes the USAF might feel is best suited to the job.

The bombers must enter the defended area at an altitude of 40,00 ft. or more, and must hold that altitude all the way

Penetration Fighter— The Air Force's latest fighter, the Lockheed XF-90, a penetration fighter almost as heavy as a DC-3 (25,000 lbs. compared to the DC-3's 29,000 lbs.). Powered by two jet engines arranged side by side behind the pilot's cockpit, the XF-90 carries as much weight in fuel as its Lockheed predecessor, the F-80, weighs altogether (about 14,000 lbs.). The original design called for two 1000-lb. thrust rockets in the tail, but these were eliminated in the "X" model. The plane has a wing span of 40 ft. and is 55 ft. long.

to the target and back to the perimeter. Upon leaving the defended area, the bombers should be required to fly an additional 2,500 miles before landing to simulate the actual return home.

The Navy, in the meantime, should be allowed to take to the air only when its surveillance radar has picked up the approaching formation. The Navy aircraft may use any methods they choose (and we happen to know they have a few tricks up their collective sleeve) to effect the interception. In "combat," both fighters and bombers should have synchronized gun cameras to score hits. The bomb-carrying bombers should have bombing cameras to score target hits.

Goals of Mission. Here's what a mission of that type would prove: (a) the controversial "invulnerability" question; (b) the ability of the B-36 to remain above 40,000 ft. for extended periods; (c) the actual range capabilities of the B-36, by a careful evaluation of fuel consumption rates under "combat" conditions, including the period at 40,000 ft.; (d) the effectiveness of radar guidance for interceptions and the effectiveness of jamming devices in stopping them; and (e) the effectiveness of fighters of lower wing loading than current USAF design in high-altitude maneuvers.

All of these factors should be considered in an evaluation; the much-publicized "fighters - can't - catch - us" claims constitute only one portion of the argument.

A careful evaluation of the camera "guns" would disclose what percentage of the bombers reached the target and returned safely. If the percentage is too high, then the investigation should be carried a step further, to find out why we have a $800,000,000 investment in the B-36. If it is within the bounds of reasonable expectancy, we should scrub this controversy once and for all, so the military can concentrate on developing defense measures to stop planes like the B-36, lest some one should build one while we're quibbling.

German Helicopter Studies: The Office of Technical Services, Dept. of Commerce, has announced the publication of "Rotary Wing Activities in Germany during the period 1939-45." The 99-page book, prepared by the British Intelligence Objectives Subcommittee, is a complete summary of Germany's wartime progress in the helicopter field. Copies are available at 60c each from the British Information Service, 30 Rockefeller Plaza, New York 20.

Air Power Speech: Copies of J. Carlton Ward, Jr.'s lecture, "The Economic Consequences of Air Power," delivered Mar. 7 at the Library of Congress under joint sponsorship of the Library and The National Air Council, are now available, without charge, from the Publications Section, Library of Congress, Washington 25, D. C.

Production Spotlight

Cancellation Cutbacks: **The Glenn L. Martin Co.** and **Curtiss-Wright Corp.** have joined the list of companies which have lost business due to the cancellation of the Air Force's Boeing B-54 project. Boeing, seeking new business for its Seattle plant to fill the gap left by the cancellation, has canceled subcontracts with both companies and will perform the work at Seattle.

Martin had originally been awarded a $1,272,141 contract for production of dorsal and vertical fins and rudders for the six-jet Boeing B-47. About $500,000 worth of the work had been completed. Negotiations are now under way to determine the exact dollar value of the work Martin had completed.

Curtiss-Wright's Airplane Division was working on a $1,345,874 subcontract for B-47 ailerons and flaps. This has been cut "extensively." In addition, another Boeing subcontract—$1,250,000 for production of B-29 power packs—was canceled by Boeing within two weeks of its issuance. C-W was also working on two B-54 subcontracts, totaling about $500,000, which were canceled. Both companies report that the cancellations will not materially affect their plants' operations.

Battle of the Quorum: *Sherman Fairchild won another delaying action in the "Battle of the Quorum", but has now agreed to permit the annual meeting of Fairchild Engine and Airplane Co. to be held on July 6. Fairchild, founder and former board chairman of the company, has blocked two annual meetings by collecting proxies and withholding them, killing the meetings for lack of quorum. Incensed at the board's action in voting current board chairman J. Carlton Ward, Jr., a $25,000 annual retirement pension, Fairchild is seeking to elect a new board. Under the agreement reached between the management and Fairchild, the management will give Fairchild until July 6 to select his candidates for directors' posts and prepare his campaign; Fairchild in turn guaranteed that his stock and any stock he is authorized to vote will be represented at the July 6 meeting, assuring a quorum.*

First Flights: Muroc Air Force Base, the heart of military flight research in California's Mojave Desert, saw two new developments within the last fortnight. The **Douglas D-558-2 Skyrocket,** a special research plane which has both jet and rocket engines, was flown under rocket power for the first time. No performance data were released by the Navy.

Later, the new **Republic XF-91,** an Air Force interceptor fighter, was flown for the first time, remaining aloft for 40 minutes. Carl Bellinger, Republic's chief experimental test pilot, handled the controls. The XF-91, powered by a General Electric J-47 jet engine, is the first U. S. plane to employ inverse wing taper, wherein the chord of the wing is greater at the tip than at the fuselage intersection.

Deliveries Soon: *North American Aviation has flown the first production model of its Navy AJ-1 carrier attack bomber at the company's Downey, Calif. plant and deliveries will start soon. The Navy has ordered 40 of the three-engine (two Pratt and Whitney R-2800 piston engines in wing nacelles and one Allison J-35 jet engine in the fuselage) bombers. North American is now working on a successor to the AJ-1, known as the XA2J, which will be larger, heavier and longer ranging.*

Industry Briefs: The Navy is now rigging a **Lockheed P2V-2** patrol bomber with arresting gear preparatory to a carrier landing attempt, designed to disprove the Air Force's contentions that large aircraft cannot land on carriers . . . The Glenn L. Martin Co. has completed the fuselage of the first production model **P4M-1 Mercator,** a two-jet (Allison J-33's) plus two piston (Pratt and Whitney R-4360 Wasp Majors) engine patrol bomber. The 80,000-lb. plane is expected to fly this summer. The Navy has ordered 19 . . . **Sikorsky Aircraft Division** of United Aircraft Corp. has successfully looped one of its S-52 helicopters. This is the second helicopter loop on record and the first deliberately attempted, a Piasecki XHJP-1 having previously been looped when the pilot found himself upside-down after a dive test. Sikorsky, incidentally, now holds all the worlds' official international helicopter records.

Reaction Motors, Inc., of Lake Denmark, N. J., builder of the XLR-11-RM rocket engine which powered the Bell X-1 in its supersonic flights, is expanding its plant facilities for increased production.

—J. J. H.

WHAT'S DOING

ON the opposite page are two significant dates in aircraft engine history.

On the first, May 14, 1947, Pratt & Whitney Aircraft acquired an option to build its own version of the Rolls-Royce Nene jet engine.

The second, November 30, 1948, marks the date on which Pratt & Whitney delivered to the Navy the first production model of that engine—the JT-6 "Turbo-Wasp". It was installed in an F9F Grumman Panther.

In between those dates, there were 566 days. And nearly every one was a red-letter day in some department of Pratt & Whitney Aircraft. For, each one marked one more step in the completion of a task that may sound easy but actually took 18 months of the hardest kind of work by our organization.

Externally, the Turbo-Wasp looks pretty much like the original Nene engine. But there the resemblance ends. The redesign of many parts, the development of improved manufacturing processes to speed quantity production and, in some cases, the substitution of new materials represent only some of the problems encountered. All told, more than a million man-hours were spent in readying the Turbo-Wasp for production. That's equivalent to the full time of one man working a 40-hour week for 500 years!

Now, to all of this must be added the tooling-up that had to be done, shop rearrangement, actual production of the engine, testing and a host of other tasks requiring additional hundreds of thousands of man-hours—all accomplished within those 566 days. The opposite page will give you some of the highlights of this achievement.

The production of the Turbo-Wasp engine represents only one phase of Pratt & Whitney's continually expanding development program. Simultaneously, we are working on the even more difficult task of designing and developing from scratch, entirely new types of jet power plants. At the same time, we are continuing the refinement and development of the well-known Wasp line of reciprocating engines.

It keeps us pretty busy.

PRATT & WHITNEY AIRCRAFT

EAST HARTFORD, CONNECTICUT

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

at Pratt & Whitney Aircraft?

1,100 DRAWINGS

We received more than 1,100 different drawings of the original Nene engine. Every one of these had to be redrawn to conform to American drafting practice.

1,000 DESIGN CHANGES

The original engine had to be adapted to use American-built accessories, as well as to provide for the use of new materials or new processes suitable for quantity manufacture. We made more than 1,000 design changes to accomplish these objectives.

5,300 SPECIAL TOOLS

It takes all kinds of tools from a simple hand drill to a 400-ton hydraulic press to build an airplane engine. For the Turbo-Wasp we had to design 5,300 special tools. Counting changes, we made nearly 10,000 tool designs before we were ready to put the engine into production.

9,000 OPERATIONS SHEETS

Each step in the processing of each part of an engine has to be outlined in detail to give the shop all the information required to do the job. On the Turbo-Wasp our production engineers had to write up more than 9,000 such operations sheets. Many of these required the handling of new materials or the use of new processes previously unfamiliar to us.

225,000 SQ. FT. OF FLOOR SPACE

In order to build the engine, we had to have a place to do the work. We rearranged 225,000 sq. ft. of floor space (equivalent to 4 football fields) for manufacturing this one type of engine. This involved careful planning of production lines, and the installing or moving of thousands of hand tools, benches and other items of factory equipment as well as 259 machines.

35,000 MANUFACTURING OPERATIONS

There are 1,088 *different kinds* of parts in a Turbo-Wasp — 7,022 pieces in all. Each goes through many operations before it is ready for assembly into the finished engine. About half the parts are built here, the rest by a specially trained team of 150 subcontractors. Approximately 35,000 manufacturing operations are done by us in our own plant in making parts for one Turbo-Wasp. To that can be added the tens of thousands performed by our subcontractors.

1,700 HOURS OF TESTING

After a complete Turbo-Wasp was built, it had to go on a test stand and pass a rigorous 150-hour type-test. And that's only part of the story. Many sub-assemblies of this engine were tested for hours on end to make sure they would stand up in service. By the time the first engine was shipped, more than 1,700 hours had been spent in complete engine testing, exclusive of thousands of hours of component testing.

10,000,000 DOLLARS

From the time Pratt & Whitney Aircraft acquired its option to build the Turbo-Wasp engine until the first production model was delivered last November, we spent more than 10 million dollars on it. That's at the rate of more than 17 thousand dollars a day. This does not include many additional millions invested in new research and test facilities devoted to all types of jet engines.

PEOPLE

ADMINISTRATIVE

Thomas T. Hinman has resigned as Atlantic-European division manager of Transocean Airlines. He announced no plans for the immediate future.

David E. Postle, former CAB employe and recently with Bell Aircraft's helicopter division, has joined Air Commuting, Inc., as vice president.

Sidney Griffith, who has been director of accounting for TWA—international, on June 1 became assistant to **B. H. Tumey,** overseas controller. The director of accounting post has been abolished.

Charles S. South, executive representative for Braniff Airways in Panama since 1946 and before that with Pan American Airways in Central America for nine years, has been appointed Braniff manager in Brazil. **Don C. Grefe,** formerly with Peruvian International Airways, takes over the post in Panama.

South

Athearn

Folger Athearn, a 10-year veteran of commercial aviation, has been named manager for Braniff Airways in Bolivia and Peru, starting June 1. A former executive of Pan American and Pan American-Grace Airways, Athearn has spent the past five years in South American with experience in operations and administrative work.

Otis E. Kline, special assistant to **W. A. Patterson,** president of United Air Lines, has been awarded a 20-year service pin, having joined Stout Air Services, UAL predecessor, in 1929 as a flight mechanic. He became a captain in 1932 and Patterson's special assistant in 1948.

Lee P. Jordan, disbursements auditor of Western Air Lines, has received his 20-year pin.

OPERATIONS & MAINTENANCE

W. L. Trimble, formerly superintendent of flight operations of TWA's international division and more recently a regular captain on international runs, has been appointed director of operations —Europe. He succeeds **Edward Bolton** who resigned and who is reportedly joining Philippine Air Lines.

C. A. Luigs, a 16-year operations veteran with American Airlines and recently operations manager at Detroit, has been named manager of operations at Chicago, replacing **Trevor G. (Buck) Williams,** retired. A World War I flyer and later a barnstormer, Williams joined AA in 1929 as station manager at Cincinnati.

Returns to Airlines— John B. Walker, who since 1944 has been president of a public relations firm in New York serving aviation and other industries in the U. S., Central and South America, returns to the airline scene June 1 as a vice president of Braniff Airways. Walker is well known in aviation circles, having been assistant to the president of United Air Lines for five years and v.p.-traffic for TWA for a similar period.

Richard L. Dobie, a 32-year aviation veteran, becomes manager of station ground services at Los Angeles for United Air Lines on June 1. Dobie succeeds **George S. Taylor,** station manager at Los Angeles, who takes over management of the Reno station. Dobie joined United in 1926 and on May 12 of that year piloted the first mail plane on the Kansas City-Fort Worth-Dallas route. In 1938 he was appointed special assistant to the v.p.-operations, which post he has held to date. Taylor joined UAL in 1931 as a passenger agent at Salt Lake City.

R. J. Camp, formerly supervisor of flight operations specifications on NWA's domestic routes, has been advanced to flight operations specifications supervisor for the entire system.

S. W. Jacobson has been promoted from superintendent of tools and equipment to general superintendent of plants and equipment for Northwest Airlines.

TRAFFIC & SALES

Thomas S. Miles, former manager of reservations and ticket offices for Chicago & Southern Air Lines, has been advanced to assistant to the general traffic and sales manager. **James A. Clarke** took over Miles' former job.

J. Richard Scott, formerly manager of rates and tariffs in San Francisco for Southwest Airways, has joined Trans-Texas Airways as district manager at Houston. He also assumes all rate and tariff duties for TTA.

Richard Aranda has been appointed district traffic manager for Pan American Airways at Maracaibo, Venezuela.

William de Mier has been appointed Canadian representative of KLM Royal Dutch Airlines.

Donald R. Wooden, formerly district traffic manager for Pan American-Grace Airways at the Canal Zone, has been appointed special representative in Balboa.

Richard E. Fisher has been appointed manager of public relations-New York airports for American Airlines, and **David C. Frailey** has been transferred from N. Y. public relations to succeed Fisher as PR representative in San Francisco.

T. P. Delafield has been promoted from passenger sales manager for Delta Air Lines to the newly created position of general sales manager. He has been in air transportation 14 years, serving with American Airlines and NATS before joining Delta.

Delafield

Richard C. Lounsbury, general traffic manager with Pan American Airways, has received his 20-year pin.

Paul Parsons, Jr., who has been in Braniff Airways' traffic department since 1947, has been named special traffic representative assigned to making air travel easier for Chinese passengers flying between Latin America and the Orient. He will handle all documentation and ticketing procedures for the groups.

Cruger D. G. Fowler, formerly traffic manager for Peruvian International Airways and KLM Royal Dutch Airlines, has joined the Ober Steamship and Tourist Agency in Washington.

Otis D. Hardy, formerly reservations manager of the western division of Delta, has been promoted to system reservations manager. **Charles J. Payne,** who has been serving as reservations and schedules manager, becomes schedules manager.

Franklin Armstrong, district traffic manager for Northwest Airlines at Minneapolis, has been given a new assignment on the company's sales and traffic staff, aiding with indoctrination of newer sales representatives, and making public appearances along the airline's system. **James B. McCullough,** former d.t.m. at Pittsburgh, will serve as acting d.t.m. at Minneapolis.

Others in the News

Wiley Wright, who has been with CAA and its predecessor agencies since 1929, heads the new Office of Aviation Development. He had been assistant to the regional administrator for personal flying development in the Seattle area since 1945. In his new job he will coordinate the activities of these regional assistants and head three divisions in Washington—Aviation Extension, Aviation Education, and Flight Information.

Arthur E. Raymond, vice president—engineering of Douglas Aircraft Co., has been elected national chairman of the Aircraft Technical Committee of the Aircraft Industries Association. **George Lescher,** of Fairchild, was elected ATC executive member on the NASC steering committee to succeed **Tom Salter** of Cessna.

Roy H. Callahan, formerly manager of the Airlines Terminal Corp. at Willow Run Airport, has formed a law partnership with William S. Campbell and David C. McCord, Jr., under the firm name of Callahan and Campbell. Offices are in the Mercantile Securities Bldg., Dallas, and the Neil P. Anderson Bldg., Fort Worth.

Lee Douglas, former chief engineer and general manager of Kellett Aircraft Corp., has been named chief engineer with the Piasecki Helicopter Corp. Prior to joining Kellett in 1944, he had been with Brewster Aeronautical Corp., Barkley-Grow Aircraft Corp., Bell and Seversky.

L. Welch Pogue, chairman of the board or directors of the National Aeronautic Association, has been named head of a U. S. delegation to attend the international conference of the Federation Aeronautique Internationale in Cleveland Sept. 1-7. Other members of the delegation are: **John J. Ide,** FAI vice president for the U. S.; **Roger Wolfe Kahn,** NAA vice president in charge of the FAI contest division, and **Jacqueline Cochran,** widely known woman pilot and NAA board member.

Dr. Klemin New President Helicopter Society

Dr. Alexander Klemin, noted aeronautical engineer, was installed as new president of the American Helicopter Society at the Society's annual forum in New York. He succeeds Ralph Lightfoot.

Elected as vice presidents were: J. E. Beighle, Sikorsky Aircraft Division of United Aircraft Corp.; Clarence Belinn, president of Los Angeles Airways; Elliot Daland, vice president of Piasecki Helicopter Corp.; Charles Wood, McDonnell Aircraft Corp., and Monroe Brown, secretary of the Helicopter Council, Aircraft Industries Association. T. R. Pierpont of Piasecki was elected as secretary, and Oliver Chittick of Sikorsky as treasurer.

Airline Commentary

By ERIC BRAMLEY

LAST ISSUE we wrote an item about insurance machines at airports, and how someone ought to make it easy for the users of these machines to buy stamps. The mail has now started to come in. Howard Sedwick, assistant manager of Austin, Tex., Municipal Airport, writes to say that "we would like to be one of the first to say that we have taken the airline passenger who buys airline trip insurance policies out of his dilemma, providing him with a stamp machine on each side of the airline trip insurance machine, which sells four different denominations of stamps." And Braniff Airways writes to point out something we had already reported but should have mentioned in connection with the insurance machines: Braniff is making stamps available (also writing paper and envelopes) to passengers at all downtown and field ticket offices. We hope the practice spreads.

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One of aviation's most interesting families, and one which has really piled up some years in this business, is the Ambrose family. Listen to this: Frank Ambrose is president of Frank Ambrose Aviation Co., which handles planes, engines, spare parts, accessories, etc. He learned to fly in 1921, flew the early air mail and started his present business in the early 30's. Bill Ambrose, who now works for Frank, was with TWA for nine years and CAA for four years. Lt. Col. Joseph Ambrose is with the Air Force at the Pentagon, and is a graduate of Randolph. Raymond Ambrose has been with various airlines for 11 years, started with Mid-Continent, and is now chief agent for Continental at Wichita. The brothers communicate with one another and with their father by "ham" radio, never by letter. Each knows almost day by day what the others are doing. Their original home was New Kensington, Pa. Father bought Frank's first plane in 1921, and then got a "ham" radio set to listen in on the boys when they were flying and working on the airlines. Yessir, the name Ambrose is really connected with aviation.

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It seems that Marvin O. Byrd, Eastern Air Lines' assistant traffic and sales manager in Atlanta, was called upon recently to speak before the "personal advancement" class at Atlanta federal penitentiary. When he finished, one of the inmates gave him a large drawing of a Constellation (New-Type, that is) labeled "The Quickest Way to Avoid Pursuit." We sorta doubt whether Eastern will adopt it as a slogan.

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Not so long ago, Angello Manzitto, Mid-Continent sales agent in Omaha, telephoned a young lady to confirm her space on an MCA flight. "Good morning," he said, but before he could get any further a sweet southern drawl broke in and replied, "Well hello, darling, how are you?" Manzitto wasn't used to such friendly greetings from passengers, but he pulled himself together and tried to tell her the purpose of the call. She broke in again: "I've been waiting all day for you to call. It's been so lonesome. I've missed you." Angello kept reminding himself that his first duty was to MCA, and replied, "You have? This is Mid-Continent Airlines. We just received confirmation on your request for space to Kansas City." Unbelieving, she gasped: "No!" Sadly, Angello replied, "Yes." (The space was confirmed).

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Fred Hunter, of AMERICAN AVIATION's west coast office, wants us to know that Ken Campbell, station manager for Western Air Lines at Rochester, Minn., is the sort of chap who lets no grass grow under his feet when it comes to working turnarounds. "The other day," says Fred, "Flight 82 arrived in Rochester at 5:38 p. m. It departed as Flight 83 at 5:39 p. m. During that one minute Campbell deplaned six passengers, boarded four, handled mail, loaded and unloaded baggage. If that ain't a record, name me one." Just offhand, Fred, we'd say that was a tolerable performance. We can't name a better one.

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You learn something every day. We often wondered how the airlines, in their color publicity pictures, made food look so tempting. Northwest Airlines tells us the secret. In a story about taking photos for Stratocruiser publicity, the company notes: "The food had been coated with mineral oil to give more glow for color pictures." Now we know.

Pounds Versus Gallons-- The Fuel Gaging Problem

By William D. Perreault

"For every pound thou shalt add to this airplane, thou shalt arrange that a pound be removed."

According to Boon T. Guyton, chief pilot—military liaison for Chance Vought Aircraft, this is the sombre warning issued by one airplane designer to the "mock up board." This board is the group responsible for final equipment placed in military aircraft, the communications and navigation gear, instrumentation, powerplant, armament, etc.

This might be the key to the military ruling that now requires fuel gaging systems compensated for temperature and providing a reading in pounds of fuel rather than gallons. At any rate, there has been a revolution in fuel gaging systems in the past year and the majority of heavy aircraft built in 1949 will be equipped with electronic fuel gages.

Specifically, the electronic type of fuel gage has now been installed in a large proportion of recent military and commercial aircraft including the Douglas DC-4, DC-6, DC-6A, C-74A and C-124; the Boeing 377, C-97A and B-47; the Convair 240; Lockheed Constellation, Fairchild C-82 and 119B. The list covers over 30 military airplanes including many fighter aircraft still on the classified lists.

Advantages. Two major factors contribute to this rapid change over. Primarily, the fuel gage is there to give the pilot an accurate indication of fuel remaining on board. Since the plane operates at wide temperature ranges within a given flight, in turbulent air and in various attitudes, the measure of a gaging system's efficiency is its ability to provide an accurate indication under all of these conditions. The electronic gage will do this. Previous systems will not.

Secondly, in an airplane like the Boeing 377, total electronic gaging equipment weight is 81 pounds. This is considerably heavier than the former equipment, but note this: The electronic gage insures accuracies at least 5-10% better than previous systems. On an aircraft like the Boeing, with 7900 gallons of fuel, this can mean savings of several hundred pounds. At 6 pounds per gallon many pounds can be removed for every pound installed.

Former Standard. The standard of excellence in fuel gaging equipment for many years has been the Liquidometer Corp's float type, remote indicating gage. This system featured a single float mechanism in each tank which actuated a rheostat in an electrical circuit and provided the cockpit indicator with the best available record of fuel volume. The cockpit gage read in gallons.

With the introduction of the DC-4, Constellation and similar large aircraft, certain complexities were introduced. Although the same basic system was used, it was necessary to add one or two float units per tank. These were connected together electrically, with each successive stage assuming pointer operation as the fluid level increased or decreased. Except for additional maintenance headaches, the system was mechanically the same.

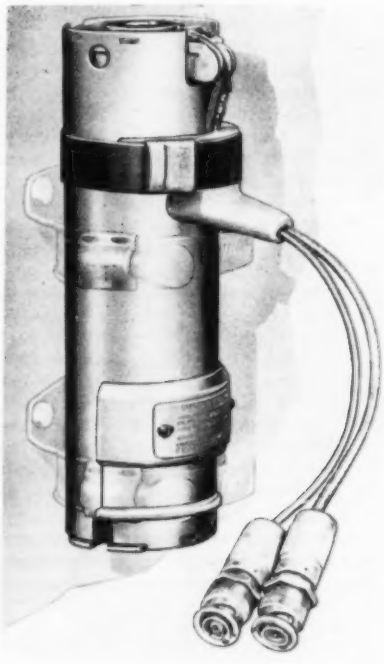
Pounds vs. Gallons. Operationally the problem took on new light. With larger volumes of fuel on board the new transports and bombers, the difference between fuel volume and poundage became increasingly important. The engines burn fuel by the pound. Engines are rated for specific fuel consumption in fractions of a pound per horsepower. Availability of "X" gallons of fuel is not an indication of how long the engine will be able to operate on this value. Operating in high temperatures, the gallonage will be relatively high, in low temperatures, relatively low.

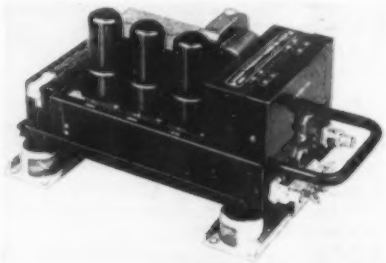
Availability of "X" number of pounds of fuel is an accurate index of the use which may be expected of remaining fuel. It is independent of temperature. In addition, the operation of the electronic gage systems now being used to provide this reading is independent of a float type mechanism for sensing fuel levels. In providing temperature compensated fuel quantity readings in pounds of fuel available, electronic gages have opened a new field.

The Manufacturers. To date, the leading manufacturers of capacitance fuel gaging equipment have been Minneapolis-Honeywell Regulator Co. and Simmonds Aerocessories. Both companies have numerous contracts for military applications and have installed units in commercial aircraft. Edison also manufactured electronic gages for a period of time and they were installed in one series of commercial ships. Recently, Edison withdrew from this market.

The Liquidometer Corp. has been working on a capacitance fuel gage system for nine years and this writing represents the first official announcement of the results.

Liquidometer now has three systems





Simple Components— These are the three major elements in the Minneapolis-Honeywell capacitance fuel gage system. At the left is the tank unit surrounded by a shield and bolted to the wing structure. The amplifier is shown at the top right and the indicator in the lower right. The amplifier senses potential difference between the tank unit and a reference capacitor. Signals from the amplifier operate the motor and gear train in the indicating instrument. A prime advantage of this system is that the amplifier is not part of the measuring circuit. Accuracy is independent of variations in vacuum tube characteristics, making it possible to change a tube or complete amplifier without affecting calibration of the system.

of capacitance fuel gages for the market. The military services are testing sets for evaluation purposes and some orders have already been received for marine applications of the system. Liquidometer feels that the long research and development program will pay dividends in trouble free operation of the systems. M-H's experience also verifies the advisability of long pre-service testing.

Improved Float System. Additionally, Liquidometer is about to introduce a major change in the float type gaging circuits which will compensate the readings for temperature and provide a cockpit reading in pounds of fuel, rather than in gallons. This should enable the float type gage to meet the military specification under which capacitance gages are now being installed.

General Electric is a relative newcomer in the marketing of an electronic fuel gage and has shipped only 100 sets of gages. GE gages are now under test by Wright Field and the Bureau of Aeronautics.

Through the use of a stationary tank unit, and in some instances multiple units in a given tank, the electronic capacitance fuel gages have been able to eliminate many of the problems of the earlier gages as mentioned above. Liquid level measurement is accomplished by a capacitor or condensor in the tank. Mechanically this is simply a pair of metallic plates separated by an airspace. In construction the plates are formed by two concentric tubes separated with an airspace betwen them.

If an electrical charge is applied to the plates of the capacitor, the capacity of the unit is determined by the dielectric or non-conductive quality of the material between the plates. In this application the space may be filled with air, if the tank is empty, or with fuel if the tank is full. In either instance the fuel level can be determined by measuring the capacity of the tank unit (in micromicro-farads). As the fuel level is raised by filling or reduced by through usage, each change in liquid level brings about an associated change in capacity.

Actually, fuel has a dielectric constant of 2 as compared to a constant of 1 for air or fuel vapor. This value is relatively constant for a given weight of fuel. This feature provides the inherent temperature compensation in fuel gage readings. As the temperature rises the volume of fuel increases but the dielectric value per unit area decreases. These factors balance out to provide identical cockpit indications for a given weight of fuel regardless of volume.

Through the use of multiple tank units it is possible to cancel out the effect of tank configuration and airplane attitude. Prior to installation of the gage system, the designers compute the center of fluid mass under varying conditions in the tank and this is used to locate the units at the point of maximum vantage. Generally, as the fuel level lowers on one unit, because of a change in altitude, it raises on another and the electrical system balance remains constant insuring a static reading on the gage.

Complete System— These elements make up a single tank system in the Simmonds Aerocessories capacitance fuel gage. A single power supply unit will handle the entire system, but as tanks are added additional tank units and indicators are used. As in all capacitance systems, it is sometimes advisable to use multiple tank units if the tank is odd shaped and maximum accuracy is desired. Design of tank units and fittings which will stand up in aircraft fuels for long periods of time was one of the major developmental problems. SA has made major changes in their unit since the early days of the gage development.

System Features. Construction features of the individual companies are the major distinction between gages of various manufacturers. Minneapolis-Honeywell, for instance, uses a motor driven gage which works through a very high gear ratio to bring stable readings to the cockpit. The gage does not change its position when the power is shut off. This has definite maintenance advantages and also stabilizes cockpit gage readings. All the manufacturers have made improvements in developing their own products, or doing research on existing products suitable for fittings and insulators in the tank units, and simplified calibration and trouble shooting procedures. Size and weight of the systems have been reduced.

Sad Experience. One of the greatest set-backs for the capacitance type gaging systems was the result of hasty installations during the period when the airlines were modifying war-time aircraft for commercial use. There were a number of airlines that experienced discouraging results with make-shift installations. Since then, the manufacturers have been universally reluctant to replace an existing gage system on a service airplane. For best results the gage should be under consideration in the original tank design.

Typical of the troubles which plagued the early units was the collection of water which shorted the tank units, absorption of water by non-conductors and resulting malfunctioning, high resistance connections in the leads, the need for recalibrating the system each time a component was changed, etc.

There are still problems but they are not serious ones. For instance, there are minor changes in the dielectric constants of fuel, since this had never before proved important, bladder type tanks change shape after filling and alter readings slightly, etc., but the fact remains, the electronic gage system has arrived.

FSF Seeks Improved Weather Forecasts

Two thousand "weather encountered reports" have been distributed to members of the Corporation Aircraft Owners Association by the Flight Safety Foundation in the start of a program to improve the accuracy of weather forecosts. Initiated with the approval of the U. S. Weather Bureau, the program provides an addressed penny postcard with simple notation blanks which require a minimum of effort on the part of the pilot.

Whenever the pilot encounters severe or otherwise dangerous weather, when good or improving conditions are predicted; incomplete information is given; weather is accurately predicted but terminology is confusing; or predicted weather is superior to weather forecasted, the pilots will be requested to forward one of the reports to the FSF. Pilots will also be urged to radio back in-flight reports of weather conditions.

Data will be supplied to the Weather Bureau for follow up action which is expected to fill in important gaps in prediction needs and initiate corrective action as required.

Panagra Completing Night Airways System in S. A.

The formidable Andes range of mountains, which thrust up sharply and ponderously along the entire west coast of South America, will no longer be a factor in disrupting the schedules of Pan American-Grace Airways.

It may not be correct to say that the airplane has entirely conquered the Andes, because they will be a problem to the airplane until the end of time or until regular operating altitudes are far higher than they are now, but Panagra and the Douglas DC-6 have succeeded in taming the mountain range to a very considerable extent.

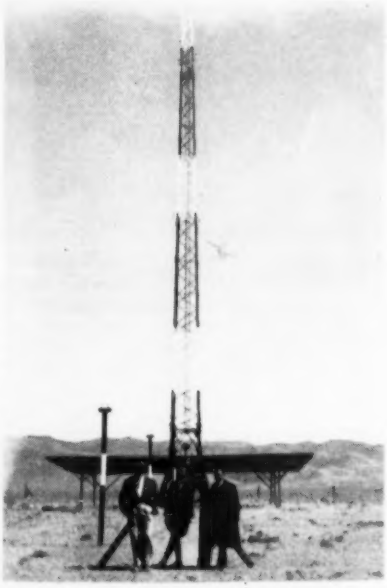
In South America they laugh at the U. S. boys who think they have tough flying over the Rockies. The highest mountain peak in the U. S. is hardly good enough to merit a name in the Andes. It has to be a mighty impressive peak under 20,000 feet to be tagged with a name down there. The reference books say the highest Andes peak is something over 23,000 feet, but the Panagra pilots maintain that some of them are 25,000 feet in the air and they can prove their case.

Day & Night System. In three short years a revolution in flying has occurred in South America and Panagra is now completing the final installations to give it for the first time a day and night 365-day-a-year airway system over that big ridge of rocks and snow. Sometimes the Andes can be crossed as low as 16,000 feet, but this is the exception rather than the rule. Panagra has taken a DC-6 as high as 32,000 feet to get over the mountains and the frequently-turbulent bad weather.

From a five-day DC-3 contact flight between Miami and Buenos Aires only a few years ago, Panagra has progressively reduced the time schedule until now it's only 22½ hours in a DC-6. But the time saving isn't the only accomplishment. The big achievement is a series of three separate day-an-night airways over the Andes between Chile and Argentina which will eliminate the many weather cancellations experienced in years passed.

Many years of observing weather conditions in the Andes revealed that there are three good passes and that weather never closes in all three at the same time. So at considerable expense Panagra has completed installations at all three points. The main airway is between Santiago and Mendoza, the route pioneered by Panagra with the DC-3 many years ago. A second airway is about 100 miles south of Santiago, near Curico. The third is several hundred miles north of Santiago, just south of Antofagasta at Monturaqui.

Possible Through DC-6. James W. Walker, Jr., a former Pan American pilot who became operations manager for Pangara three years ago, has directed the modernization program made possible by the high-flying pressurized DC-6. He thinks the new program insures dependability of scheduling from here on out and recent operational experience indicates he is right. It's a far piece down the road from Buenos Aires to Miami—just under 5,000 miles—but Panagra DC-6's are operating pretty much on schedule.



Blaw Knox Tower— Eleven Blaw Knox towers, such as this one at Monturaqui, have been installed to aid Panagra's operations. This one, 14,500 feet high on the northern pass between Tucuman, Argentina, and Antofagasta, Chile, was installed in winds up to 40 and 50 miles an hour—normal velocity in that desolate country.

A $500,000 radio-telephone program has now been completed but this represents only part of the modernization expenditures.

Panagra now has 26 1200-watt dual Aeraco transmitter aerophares between Cali, Colombia, and Buenos Aires. Five of these are new stations. Prior to the end of 1945 these stations were single facility and were mostly low power stations.

Eleven Blaw Knox towers have been installed. These are self supporting steel towers and require no guy wires for support. They are of extremely heavy construction and should last for many

years without service other than paint. Some of these towers are at high altitudes, one being at 14,500 feet.

Ten new runway locators have been installed along the system. These are 75-watt low power aerophares and are placed 1500 feet off the end of the instrument runways in order to facilitate lining up with the runway under instrument conditions. Walker says these locators allow Panagra pilots to accomplish just about what ILS permits with respect to instrument landings.

Four 3 kw. Collins radio telephone transmitters have been established at Santiago, Chile, and Santa Cruz, Bolivia, and two at Moron Airport in Buenos Aires. One kilowatt Pamsco radio telephone transmitter has been established at Cali, Quito, Guayacil (2), Arica, Antofagasta, Mendoza, Cordoba, Salta, La Paz and Arequipa. A new station has recently been installed at Las Ramadas.

Equipment improvements and modernizations include dual radio-compasses in all DC-3A aircraft, new control panels for pilot control of communications in DC-3A aircraft, the addition of auxiliary receivers in DC-3A's, and modification of DC-3A transmitters from 8 to 16 frequencies. DC-3's do not have night authorization over the Andes.

Weather stations are maintained by Panagra in each of the three trans-Andean passes.

Holcombe Pilot Training Aids Available for Lease

Aviation Activities, Inc. has announced plans to lease the pilot training aids developed by Ralph Holcombe to instructors and other potential users at a cost of $15 per month, following an initial down payment of $50. The fee would include maintenance of the units and improvements as developed during the term of the lease, according to Holcombe.

The Holcombe system consists of a headpiece worn by the student to provide audible signals for instruction purposes as supplied by the instructor. The inventor claims that the system removes psychological barriers caused by voice communications, improves reaction time and reduces the time necessary to qualify a pilot for solo flight.

Aviation Activities, manufacturer and distributor of the aid is located at 903 15th St., N. W., Washington 5, D. C.

Weather Ship Network Wins 3-Year Extension

The North Atlantic Ocean weather ship network, originally established by an ICAO agreement in London in 1946, has been assured of continued support for the next three years. In a new agreement reached by ICAO in its London meeting during May, the participating states agreed to finance 10 weather ships for the period starting July 1, 1950. The ships are used to supply weather, communications and rescue services for North Atlantic traffic.

Although the original agreement in 1946 called for the establishment of a 13-ship network, this was never fully implemented. To maintain the 10-station commitment of the new agreement, it will be necessary to operate 25 ships.

These will be operated by the contracting states as follows: United States, 14; Canada, 1; United Kingdom, 4; France, 2; Netherlands, 2; Norway, 2. In addition, Belgium will pay $100,000 annually to Norway toward the cost of operation of one station off the Norwegian coast. Denmark will pay $92,000 annually toward this same station. Ireland and Portugal will each contribute $4,000 annually toward the over all network.

100 Years of Service—Shown above are seven of nine TWA pilots who recently received their 10 year service pins. The pins were presented by Harry E. Campbell, left, TWA superintendent of flying—international, who has 20 years with TWA. From left to right, the remaining pilots are Capts. Walter Hawkins, A. D. Heath, E. W. Utgard, Robert Day, N. A. Hortman, F. L. Austin, and S. G. Hawes. Capts. Ernest Pretsch and J. M. Walker, the balance of this group, were on flight duty at the time of this photo. Total logged time among the group exceeds 12,000,000 miles.

Among the Suppliers

THE Line Material Co. has elected **W. D. Kyle, Jr.** to the post of president to succeed his father, **W. D. Kyle, Sr.** The latter retired from his post as president but will continue to take an active part in company affairs as chairman of the board of directors. Kyle was the founder of this well-known firm specializing in the manufacture of airport lighting and electrical distribution equipment and has been its active head for 39 years. W. D. Kyle, Jr., the new

W. D. Kyle, Sr. W. D. Kyle, Jr.

president, joined L-M in 1937, later became president of the Kyle Corp. which he headed until its merger with L-M in 1947. At that time he became executive vice president of the Line Material. L-M has nine plants in six states and Canada and employs more than 3,000 persons.

The 50 year history of the **Goodyear Tire and Rubber Co.** is interestingly related in the second edition of *The House of Goodyear*, a 700-page book by Hugh Allen. Goodyear's history spans the automotive and air ages, and this volume paces both industries as new rubber processing and compounds permitted advances in the trade and new trade advances mushroomed the everyday use of rubber products. The story relates more than the history of a company. It symbolizes the growth of modern business in the U. S. The House of Goodyear is published by Corday and Gross Co., 1771 East 25th St., Cleveland 14, O. Priced at $3.

Charles E. Heywood has been appointed service engineer for the **Elastic Stop Nut Corp. of America**, Union, New Jersey. He is a member of SAE and was previously associated with Chance Vought . . .

Heywood

Samuel and Hirschberg, 204 Valentine St., Hackettstown, N. J., has acquired the manufacturing rights of a complete line of paint line-stripping machines for airfields, highway and street use, etc. The equipment was formerly manufactured by Industrial Tools and Products Corp., Rochester, N. Y. . . . **The Texas Company** has donated a 10-passenger Lockheed 10-A, valued at $30,000, to Purdue Aeronautics Corp. The plane will be used for instruction in the Flight Option offered at Purdue University.

Britishers in Denver— These three Britishers were interested participants at the recent Airport Operators Council annual meeting in Denver. Left to right, W. M. Churchill, advertising and machine sales manager, Associated Aviation Underwriters, New York; Peter Hadfield, assistant civil air attache, British Embassy, Washington; and I. W. Baldwin, manager of aviation division of Bowser, Inc., Fort Wayne, Ind., who donned his monocle for the occasion. Hadfield had never previously met Churchill and Baldwin, who have long been associated with U. S. aviation activities.

The American-Coleman Co., 340 W. O. W. Building, Omaha 2, Neb., has been awarded an Air Force Contract to supply 20 specially designed "Mules" for ground towing of B-36 bombers. The unit weighs 16 tons and moves the 137,000 pound bomber . . . **Horton Conrad**, president of Material Movement Industries has been appointed to direct sales of the new Conveyor Division of the **Lake Shore Engineering Co.**, Iron Mountain, Mich.

William H. Seymour, vice president of the Liberty Mutual Insurance Co. recently awarded a bronze plaque to **Pratt & Whitney Aircraft** for its industrial illness and injury record. P&W's accident and illness rate for 1948 was only 5.6 injuries or illness for each million man-hours, compared to a rate of 8.71 for all Hartford County industries.

——TECHNICAL LITERATURE——

D. C. Motors: Haydon Manufacturing Co., Inc., Torrington, Conn., is circulating an 8-page bulletin describing its direct current motors for timing applications. The bulletin describes the performance characteristics of the Haydon 9200 series D. C. motor giving specifications, description of motor applications, speed regulations, and methods of determining speed and current. Specs include voltage, rotation, shafts, pinions, current drain, leads, torque, weight and speeds. Requests for free copies of Engineering Bulletin No. 1 should be addressed to E. B. Hamlin, advertising manager.

Controlling Corrosion: Alox Corp., Buffalo Ave. & Iroquois St., Niagara Falls, N. Y., has published Technical Bulletin No. 3 describing the physical and chemical properties of a group of surface active agents known as Alox 350. The active agents are effective in controlling corrosion in internal combustion engines, hydraulic systems, turbine systems and in handling and storage of fabricated steel parts. Alox 350 is available as a solid of low melting point or as a 10% concentrate in low viscosity well refined mineral oil. Bulletin No. 3 gives results of laboratory test in humidity cabinet, storage shed, sea water immersion and GM fuel and oil tests.

Test Barrel— An Eastern Air Lines mechanic is shown here checking out a cabin pressure relief valve used on the Lockheed Constellation. The simple test stand was designated by EAL to test this and the auxiliary vent relief valves when received from the vendor and after overhaul on service units. Air is pumped into the metal drum from outside sources and the manometers on the left are used to record pressures at which the valves function. Normally the valves start operation when mercury reaches 8.5 inches.

Daily Plane Utilization

International

		Jan.	Feb.
AA	4 eng. pass.	4:01	5:59
	cargo	3:03	5:01
AOA	2 eng. pass.	1:12	1:28
	4 eng. pass.	5:56	6:02
Bnf.	2 eng. pass.	....	1:49
	4 eng. pass.	5:34	3:44
C&S	2 eng. pass.	5:22	6:37
	4 eng. pass.	6:57	7:32
Col.	4 eng. pass.	5:13	5:32
EAL	4 eng. pass.	9:25	9:21
NAL	4 eng. pass.	9:04	9:20
	cargo	3:28	2:43
NWA	4 eng. pass.	10:05	10:07
Panagra	2 eng. pass.	4.02	4:25
	4 eng. pass.	5:44	5:24
	cargo	3:49	5:40
PAA			
Lat. Amer.	2 eng. pass.	3:42	3:40
	4 eng. pass.	8:22	8:36
	cargo	2:33	3:58
Atlantic	2 eng. pass.	4:11	3:41
	4 eng. pass.	9:56	6:30
	cargo	9:08	7:16
Pacific	4 eng. pass.	10:32	10:29
	cargo	12:10	8:53
Alaska	4 eng. pass.	8:11	8:47
TWA	4 eng. pass.	6:36	6:13
	cargo	5.44	5:53
United	4 eng. pass.	6:22	6:09

Feederlines

		Jan.	Feb.
AAA	SR-10-C	3:18	4:22
	D-18-C	5:02	4:22
Chall.	DC-3	5:58	7:21
Empire	DC-3	5:34	4:45
Florida	D-18-C	3:37	3:37
Monarch	DC-3	6:11	8:14
Pied.	DC-3	7:28	6.45
Pioneer	DC-3	6:11	7:50
Robinson	DC-3	3:28	4:03
SWA	DC-3	5:32	5:39
TTA	DC-3	5:59	7:15
W. Coast	DC-3	4:33	4:47
Wis.	L-10-A	3:29	4:30

Extra Section

By William D. Perreault

UNITED Air Lines recently conducted experiments in conjunction with the San Francisco airport fire department to determine more effective methods of rescuing persons from burning or damaged aircraft. The tests were conducted using a DC-4 fuselage equipped with a DC-6 type window arrangement. Tests revealed that it is considerably easier and safer to chop through the metal than to break in the windows. The double layer plexiglass windows are difficult to break and offer more possibility of personnel injury than the metal. One conclusion was that it is worthwhile to provide "chop marks" on the fuselage to indicate the areas in which safe and easy access could be assured in emergencies. United has started using yellow markings for this purpose.

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Capital Airlines is considering the use of "oxygen candles" in DC-3 aircraft to meet requirements of the proposed revisions to Civil Air Regulations. These are the compact chemical generators of oxygen manufactured by Mines Safety Appliance Co. Candles are light weight and have an indefinite shelf life. They are manufactured in 10 and 30 minute sizes.

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Thompson Aircraft Tire Corp., Miami Springs, Fla., has sent out a guide for airline mechanics itemizing eight types of defects that render the tire unfit for retreading. Typical of the defects listed are those tires cut through more than 25% of the total number of plies, having loose cords on the inside, holes through the casings larger than nail holes, radial cracks or deep checks in sidewalls, broken bead-wires, etc. Thompson is a major firm in the recapping or retreading of aircraft tires and has processed over 46,000 tires without a failure. Recently Thompson acquired a mold for the 19.00 x 23 tires used on the C-46.

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United Air Lines recently experienced complete loss of cabin pressurization in a DC-6 while flying at 15,000 feet altitude. Loss was due to a cargo compartment door opening slightly after the latch had unfastened. In addition to an instantaneous loss of pressure, the dust stirred up by air movement in the cargo compartment set off the fire detectors. Opening of a floor panel to determine what was going on permitted a cloud of dust to enter the cabin and cause further disturbance. No baggage was lost. Lessons to be learned: Door latching is doubly important on pressurized aircraft. Dust and dirt in a baggage compartment is mighty critical.

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Pan American Airways has three members of one family with a total of 53 years in the company's service. This is the Berounsky family. Eddie J. Berounsky holds a record for not missing a regular working day since he joined PAA on March 1, 1931. Ed is a metal shop foreman at Miami. His father, Eddie L., received his 20-year pin last month. Brother Theodore, assistant foreman of metal overhaul, has been with PAA for 15 years. Two of Pop Berounsky's daughters, Sylvia and Eve, also pitched in and helped during the war, one in the planning section and another in the Link training division.

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Much of $14,202, saved monthly by Capital Airlines through interline agreements, is payment for maintenance work done for other carriers, according to J. H. Carmichael, president of Capital. Union objections to this "farmed out" work may curtail these contracts in the future.

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American Airlines has presented A. F. McAmis with the Award of Merit for the "design and construction of a Stratocruiser cockpit model for use in training flight crews." That's a simple expression for a lot of work and personal initiative on the part of McAmis. Designed and built during periods between his regular assignment as equipment instructor with AOA, the whole mockup cost less than $3,000. It is a full scale model with all positions, controls and instrumentation, as in the AOA Stratocruisers now on order.

NEW PRODUCTS

Midget Headphone

Air Market Associates, P. O. Box 68, Staten Island 1, N. Y., is marketing "the smallest radio headphone ever developed" for standard aircraft use. Known as the Fly-Fone, the new unit resembles miniature hearing aids now

used by hard-of-hearing persons. It is about the size of a nickle, fits into one ear and brings the signal directly to the eardrum. Weighing 2½ ounces, the new light-weight headphone is said to be 12 times as sensitive as the conventional unit, reduce static and mechanical interference and work on a minimum volume.

The phone is connected to a jack clipped to the wearer's belt and a detachable wire connects the belt clip to the receiver jack, permitting the pilot to disconnect it without later needing to readjust the headset.

Heavy Duty Energizer

General Electric Co., Schenectady 5, New York, has announced the production of a new portable, heavy duty aircraft energizer designed to provide regulated 28½-volt power for starting engines of present day transports and variable voltage power for starting jets. Available on a short shipment basis, the energizer consists of a 28½-volt, 500-amp continuous generator with associated controls.

The unit can be provided with an induction motor drive for stationary mounting on a two-wheel dolly for manual handling or with a gasoline engine drive mounted on a pneumatic-tired trailer. Three constant current taps permit selection of proper current at 650, 800 or 1,000 for jet engine starting amps while voltage can be adjusted from 28 to 35 volts. A fan built integrally with the rotor insures adequate cooling. Additional data contained in bulletin GEA-5324 available from the above address.

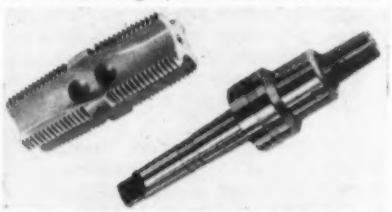
Oil Refiners

Automatic Oil Refiners, Inc., Orchard Park, N. Y., has introduced an automatic device for re-refining lubricating oil after it has been removed from use. The apparatus uses a catalytic process with high temperatures and sub-atmospheric pressures as well as normal filtering. It is designed to remove carbon, acids, metal particles, water and dirt from the oil to make it suitable for reuse.

Dimensions are: diameter, 25"; height, 44"; weight, 300 pounds. It operates on either 110 or 220 volts A. C. current at 60 or 25 cycles, either single or 3-phase. With capacity of 3½ gallons per operation, it should be able to handle 100 gallons of oil per day.

Steel Counterbore

Aircraft Tools, Inc., 2306 East 38th St., Los Angeles, Calif., is marketing a new type counterbore, precision-made from specially selected hi-speed steel. Featuring heavy duty tooth construction, 2" overall length, more flutes for cleaner



and smoother cutting and positive chip clearance, the AT-88 has interchangeable pilots available in all sizes. It is made in a complete range of sizes in both straight shank for use in drill presses and taper shanks for use in machine spindles thus eliminating holders and adapters. The design is claimed to retain its cutting quality for longer periods.

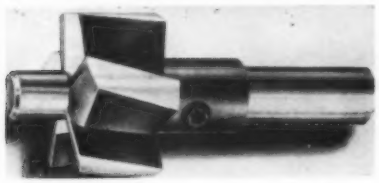
Portable Grinder

The Aro Equipment Corp., Bryan, Ohio, has introduced a new air-powered 8" grinder featuring magnesium castings for lightness and a steel housing for protection. Weighing only 14 pounds, the new grinder is governor-controlled, has a built-in oil reservoir, flush fittings for grease lubrication and a removable air strainer. The units are available in spade and straight handle models, 6" and 8"

sizes, with selected range of speeds including 4,200, 4,500 and 6,000 rpm. All models have 5/8" x 11" spindle thread. A grinding wheel or brush is provided with the tool.

D-Line Taps

National Precision Tool Co., P. O. Box 523, Carnegie, Pa., has introduced D-Line double end taps which the manufacturer claims give more than double the life of conventional taps. Made of high speed tool steel, the double end tap has



cutting threads on both ends with a special floating tap holder which mounts over the idle end. With initial cost comparable to regular single ended taps, the new units offer lower over-all cost. The photo shows the tap with the holder attached (left) and by itself. Standard taps and holders are available for immediate delivery from stock and special sizes can be delivered in two to three weeks.

High Temperature Fabric

W. A. Plummer, Mfg. Co., 752-54 South San Pedro St., Los Angeles 14, Calif., has introduced a high temperature, coated fabric known as Plummite G-752. The manufacturer claims that the material is lightweight, will withstand temperatures of over 500 degrees F. and retain its flexibility, has good resistance to hydraulic oils and "quite good" resistance to aromatics. In wrinkling tests, Plummite compares favorably with .0051 monel foil. Following treatment with silver or aluminum foil Plummite has heat reflections characteristics which will prove of value in some applications. The material was originally developed for jet aircraft tail blanket manufacture.

Telescopic Truck

Revolvator, North Bergen, N. J., has added a new model 6-48 telescopic, straddle type, high liftruck to its line. The "Go-Getter" power liftruck has a capacity of 2500 pounds, a collapsed height of 68 or 83", and a lift of 85 or 115". Operating within a 6-foot aisle, it handles 48x48" pallets. Additional information contained in Revolvator bulletin 168.

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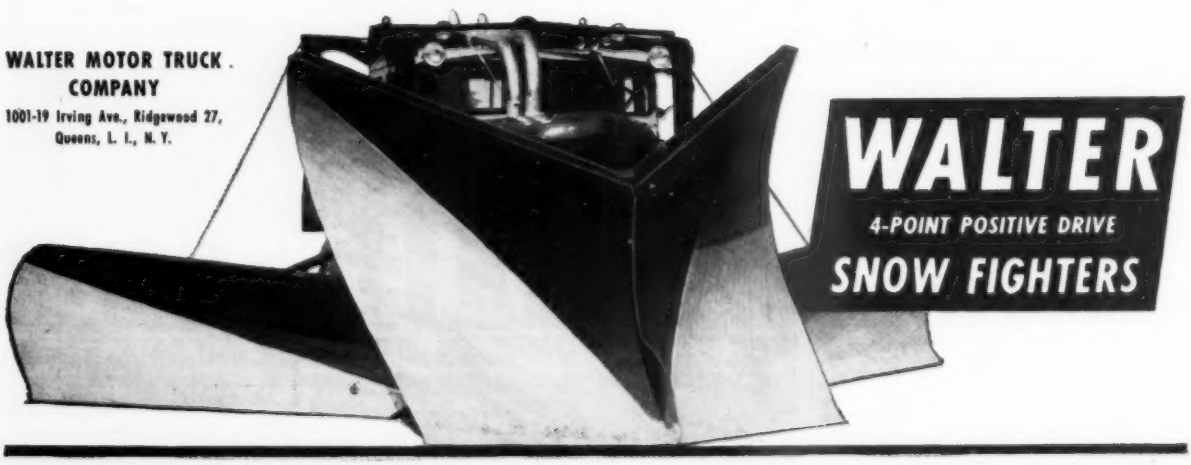


AIRPORTS

Including Features Formerly in AIRPORTS AND AIR CARRIERS Magazine

New Airport Light Aids Proper Landing Approach

By ROBERT C. BLATT

A new airport landing light, known as the Flett Landing Beacon, has been developed and patented by W. J. Flett of Lansdowne, Pa.

This new lighting landing aid is especially designed to give an incoming pilot a continuous indication, not only as to his altitude (whether he is too high or too low for a safe landing), but in addition as to his position with respect to the runway (whether he is too far to the right or left of the runway).

It consists of a single lighting unit having two projectors, one mounted above the other. The upper projector of the unit indicates the glide path, and the lower projector the course in relation to the runway—somewhat similar to the now familiar ILS glide path and localizer radio beams, but making use of colored lights to tell the pilot his proper approach angle and course.

Three Beams. Each projector forms three beams of light—green, amber and red—and the pilot simply maneuvers his plane so that both projectors show an amber light, and, by following down the glide path keeping both lights showing continuously amber, he can make a safe landing without even looking for the runway.

If the plane's glide is too steep, it enters the red beam of the upper projector. If the pilot approaches too high he sees the green beam of this same (upper) projector.

Similarly, if he is too far to the right of the runway, he sees the green beam of the lower projector and if he is too far to the left he sees the red beam of this (lower) projector.

The line of cut-off between the three colored beams of each projector is so sharply defined, according to Mr. Flett, that when using a small demonstration model for tests conducted at a distance of one and one-quarter miles, the "beacon" would completely change color with a 6-inch movement of the observer. This model used only a simple lens arrangement and the output is claimed to be approximately 5,000 beam candlepower (in amber light).

To Sell or License. Flett, not being a manufacturer, is planning to sell or license his patent to one of the airport lighting equipment manufacturers.

His light should not be confused with the "angle of approach indicator" which was used by the military during the war and is now being manufactured and sold by the Westinghouse Electric Corp. at Cleveland, Ohio. This unit provides a glide path indication using the same three colors of light, but having the green beam as the center or safe landing beam to follow down. It is now being used successfully at a number of airports about the country.

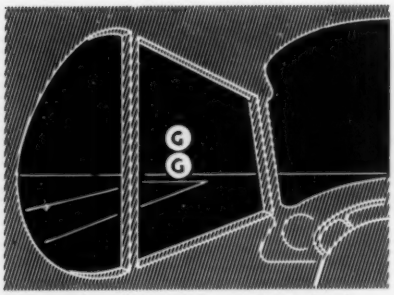
Approach indicator lights of both these types are not intended to replace the conventional runway marker lights, but to augment them. They would be especially useful at airports where there are existing semi-flush contact lights. Under low visibility conditions the higher candlepower of the approach indicator lights would penetrate considerably farther and be of greater aid to the pilot. Also where snow or high grass may obscure the beams of the semi-flush units, these raised lights would still be as effective as ever.

This light can easily be connected in the standard airport series 6.6 ampere runway or boundary light circuit through an isolating transformer, or it can be fed directly from a multiple 115-volt circuit.

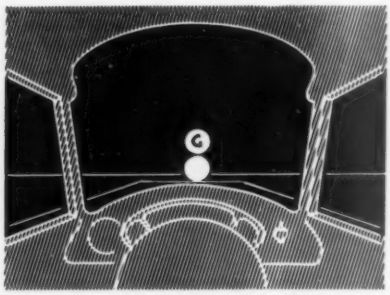
At small airports where the owners are unable to buy any other field lights, these approach indicator type lights would permit emergency night landings to be made until complete conventional systems could be installed. The approach angle could be set so that the paths of light would bring pilots in safely above any obstructions in the approach path.

APPROACH ANGLE INDICATOR Light made by Westinghouse Electric Corp. provides pilot with continuous altitude information. Flashing yellow lights mean he is too high, flashing red means too low, and flashing green—correct altitude.

NEW FLETT Landing Light gives pilots proper approach angle indication for both glide angle (top projector) and course (bottom projector) by means of red, green and amber beams of light.



1. To right of runway and too high.



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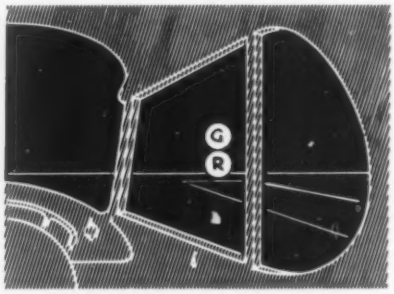

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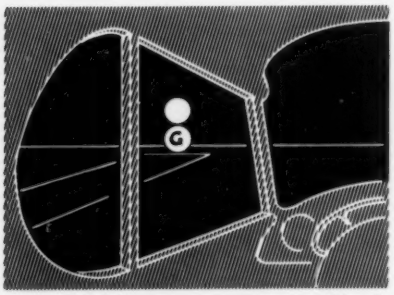
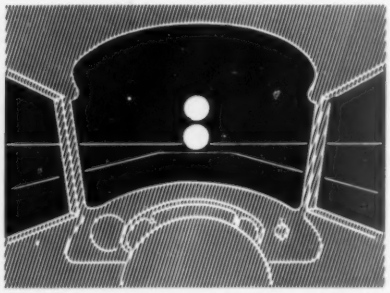
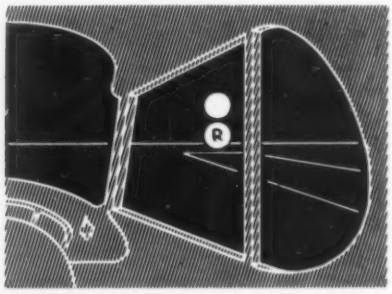


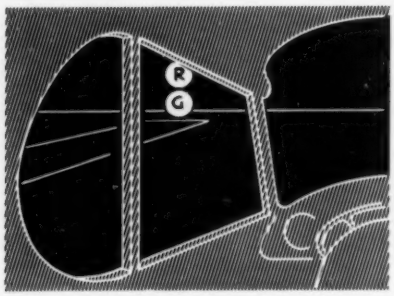
4. To right of runway—proper altitude.



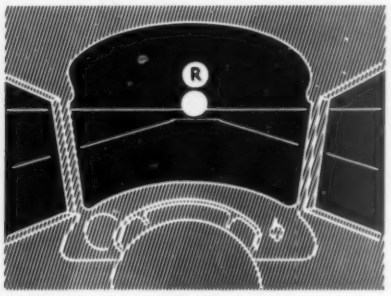
5. Over runway and proper altitude.



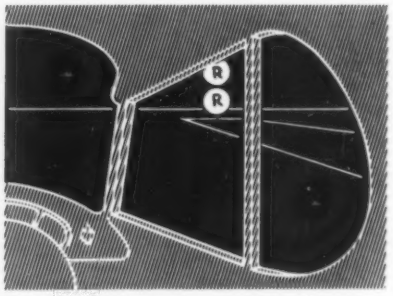
6. To left of runway—proper altitude.



7. To right of runway and too low.



8. Over runway but too low.



9. To left of runway and too low.

FLETT LANDING LIGHT as viewed by an approaching pilot. G indicates green, R is red and the unlabeled indication is amber.

Line Material Explains Future Sale Arrangements

The Line Material Co. has released facts relating to the future sale of airport lighting subsequent to April 18 when it terminated its contractural arrangements with J. B. Bartow. Line Material explained that Bartow was retained by them as a consultant and paid a royalty on all lights produced. Since the Bartow patents cover only the right to install and operate a lighting system for the landing and take-off of airplanes, this relationship was not fully effective.

Finding no practical manner in which to prevent competitors from free use of the same patent rights without cost, Line Material "found ourselves at a disadvantage when paying royalty to Bartow Beacons based upon the sales of our lighting units, no royalty being paid by competitors."

In the future L-M equipment will "stand on the same basis, patentwise, as the installation of competitive equipment. In other words, there is no L-M warranty (nor warranty by competitors) against infringement when the system is installed and used for the take-off and landing of airplanes." In the case of L-M equipment purchased prior to April 18 when the former L-M, Bartow agreements were in effect, L-M states that no patent problems are involved.

The Bartow patents have been taken over by The Welsbach Corp. and will be handled on a royalty basis with the airport operator or installation company paying about 80c per lighted runway foot for the use of the patent rights. The first test of the rights under these patents is apt to result following the use of these principals at the airport in Madison, Wis. This is the first airport to initiate use of the lighting system since the agreement was announced and calls for a royalty payment of about $5,000.

Strobeacons at La Guardia

Six Sylvania Strobeacons have been installed adjacent to the runways at LaGuardia field to provide a reference point as to where the pilot should lay his wheels down in low visibility approaches. The lights, which are similar to those used in the Sylvania approach light system used at Newark Airport, are mounted at either side of the runway at a 45 degree angle to the end of the runway.

These high intensity, flashing lights are rated at 20,000 candlepower and are used only during poor visibility conditions. During periods of good visibility, green neon tubes provide a simple reference of the position.

The U. S. Coast and Geodetic Survey, Washington 25, D. C., has published a new coded departure route chart for **La Guardia** and **Newark Airports.** Copies are available at 5c each.

Oertel Favors 'Brand Integrity':

Esso Hydrant Answers Airport Fueling Requirements

Airport operators must not only be above suspicion, they must avoid the very appearance of evil. That is the warning R. C. Oertel, manager of aviation market activities for Esso Standard Oil Co., offered to members of the Airport Operators Council at the recent meeting in Denver. To do this, the operators must evaluate the many services which they are expected to perform and establish an equitable system of payment which will be readily recognizable.

Oertel's comments dealt particularly with the storage and distribution of aviation gasoline. His thoughts may prove a prophecy of what is in store for airport operators and airport users in the months immediately ahead for, concurrently, CAA was releasing new airport regulations which will enable federally supported airports to provide exclusive gasoline concessions. This action may prompt the very evils which Oertel outlined.

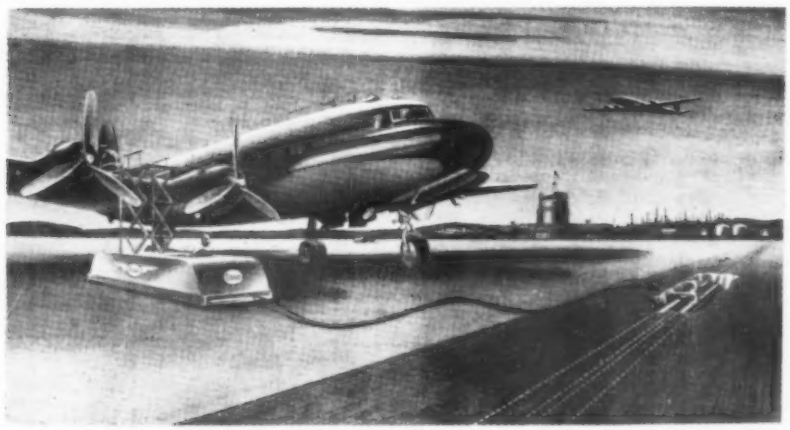
Everyone recognizes that the airports are in need of additional revenue. The most obvious way in which this can be obtained is to raise the cost of services rendered. In this field, the possibilities offered by all types of concessions, and particularly concessions for fuel and oil sales, are so promising that they are apt to be abused.

Dangerous Potential. The concession in itself can hardly be called evil. Oertel emphasized that the real concern is in the dangerous potential for corrupt practices, the waste which accompanies such agreements, and the fact that such concessions are contrary to American business principles which encourage competition. These po.entials exist regardless of the manner in which concessions are accomplished, whether by outright sale, granting of exclusive use of low cost storage and distribution facilities, or the retention of these privileges by the airport operator.

The real answer to this problem appears to be one of airport design. Past practice and, to a limited degree, thinking in some circles today, provide expensive and inefficient methods for fuel storage and distribution. The initial cost of installation is high, maintenance costs are out of line and the true need for flexible servicing facilities is not met. More efficient systems could mean more profit without increased prices.

Three Competing Systems. The problem starts with the high priced fuel truck used in the most common system of fuel disbursements. The $15,000 truck moves across long distances to centrally located supply storage tanks and takes on a load of fuel. Hundreds of thousands of gallons of volatile fuels are transported over busy highways and brought onto already crowded ramp areas to service the airplanes.

In addition to the high maintenance and depreciation costs (which average about $250-$300 per month) the truck



Esso Hydrant System—This is an artist's concept of a hydrant type fuel servicing system in operation. In this instance, the most elaborate of hose carts is being used but in many cases the cart simply consists of a two-wheel carriage for a dual hose assembly. The cart does not carry any fuel in the body but simply draws from plumbing supplied by one or more fuel storage tanks in remote locations. Esso Standard Oil Co. has pioneered in this work and has proven its practicability at Moisant International Airport in New Orleans. A similar system is now being installed at Philadelphia's International Airport.

is a source of damage to aircraft and a major fire hazard on the field. It was not an arbitrary decision that brought about the use of these trucks. In many instances they are a necessary evil.

To combat the troubles experienced with the truck type of fuel distribution, some airports have designed pit systems which feature pipe-line supply from the central storage system to the apron area. They offer many advantages and particularly the elimination of the trucking hazards and expense. But pit type systems are expensive to install and offer very little flexibility. Airplanes must be spotted for servicing and the large variety now in operation offer servicing problems. The necessity for keeping a given area clear at all times for servicing functions has it disadvantages.

The system is an improvement, according to Oertel, but is not the ultimate in design.

The Hydrant System. To fill the all-around needs of the airport operator by providing low initial cost, minimum maintenance and depreciation costs and maximum flexibility, Oertel urges the consideration and adoption of the hydrant type of fuel system. Oertel speaks from experience. The hydrant type fueling system is the result of years of design and testing by Esso. Installed at the Moisant International Airport in New Orleans, the system proved itself beyond all doubt.

The hydrant type fuel distribution and bursement system is the same arrangement used by every city in the U. S. to provide fire fighting water in large volumes on short notice. It consists of a central supply or storage system, plumbing to the area of use, a simple system for connecting the flexible hose leads from the hydrant to the airplane and a fuel booster pump. The hose and pump unit are generally mounted on a baby-carriage size hose cart which accommodates sufficient hose to provide system flexibility.

Flush type hydrant connections are tapped to the main supply line and located at convenient spots along the apron area and in related positions. The design of a simple effective quick disconnect coupling which permits the hose cart to be connected and disconnected to the system without the loss of a cup of fuel was an engineering accomplishment.

Cost Analysis. At Moisant, Esso provided dual storage arrangements to enable use of two grades of fuel, installed associated six-inch pipe lines to the apron, and located seven pair of hydrant outlets there. Total cost was about $46,000, or some $9,000 less than required for truck type disbursing and $12,000–$13,000 less than for an equivalent pit system, according to Oertel. Even with the lower initial costs, depreciation and upkeep expenses, the system provides a superior type of service.

Hose carts of varying size and complexity have been produced. In addition to the simplest type mentioned above, some are power driven, contain extension ladders, micronic filters, defueling equipment, etc. Delivery rates are as high as 150 gpm.

Although the system at Moisant was installed under the pavement, at Philadelphia's new international airport a system utilizing a sand filled trench of concrete construction is used. Low installation and maintenance costs make this system more desirable.

Brand Integrity Important. Oertel expressed appreciation of recent studies that cited the superiority of hydrant type of fuel servicing equipment but frowned upon the fact that "the study utterly fails to evaluate correctly the insignificance of the premium required to preserve brand integrity, which is one of the foundation stones upon which competition rests."

Installation of multiple plumbing lines to accommodate brand integrity would cost more in the initial installation than a single system with only grade separation. However, Oertel claims that the advantages of brand integrity over a system of co-mingled supplies makes the difference in cost "a price damn well worth paying for the advantages."

He claimed that at an airport handling 7,200,000 gallons of fuel per year, of two grades, as supplied by three companies, the premium per gallon would be 21/100c. If the volume reached ten million gallons it would be only .156c per gallon. These premiums are "peanuts compared to the oil companies expenditures for brand improvement in their customers interests," Oertel explained. "Lead fouling, induction system deposits and other such obstacles to greater engine life between overhauls, have caused petroleum companies to spend millions for product improvement. It is becoming more and more recognized that specification alone is not a sufficient guarantee of quality. The integrity of brand has its part too, and it is an increasingly large one."

CAA Offers 100 New Airport Grants

Winding up the second year of actual spending under the Federal-aid airport program, the Civil Aeronautics Administration during the 11 weeks ended May 15 made an even 100 airport grant offers entailing slightly over $8,000,000 in Federal funds.

During the period from March 1 through May 15, grant offers went out at an accelerated clip, boosting the cumulative total from 664 to 764 and total Federal-aid grants from $68,615,589 to $76,618,012. Grants during the

11-week period totaled $8,001,771.

Of the grant offers made during the period, 18 were for Class I airports, 19 for Class II airports, 24 for Class III fields, 38 for Class IV and larger ports, and one for a seaplane base. Of the total grant offers made through May 15, 194 were Class I, 206 for Class II, 211 for Class III, and 251 for Class IV and larger.

Grant offers for the March 1-May 15 period, by state, were as follows, with class shown by figures in parentheses:

ARIZONA: Douglas Municipal (Class 6), $38,340; Cottonwood-Clemenceau Airport (2), $16,217; Chandler Mun. (2) $13,510; Phoenix Sky Harbor Airport (5) $24,202 and $47,245.

ARKANSAS: Guidon Municipal (1), $15,440.

CALIFORNIA: Hayward Mun. (4), $9,452; Buchanan Field, Concord (4), $48,049; Borego Valley Airport (1), $4,874; Fort Jones Airport (1), $3,520; Cedarville Airport (1), $1,225; Pixley Airport (1), $16,286; Dunsmuir Airport (2), $10,824; and Siskiyou County Airport (6), $5,416.

COLORADO: Greeley Mun. (3) $5,100; Walker Field, Grand Junction (3), $65,500; and Adin Mun. (1), $225.

FLORIDA: Miami International Airport (6), $262,625 and $60,000.

GEORGIA: Reginald Grant Memorial Airport, Thomaston (2), $1,350; and Atlanta Mun. (5), $560,000.

IDAHO: Mackay Airport (1), $2,379; Caldwell (2), $4,640; Twin Falls Mun. (3), $12,300; Kooskia Mun. (1), $1,069 and $830; Boise Mun. (6), $42,218.

ILLINOIS: Peoria Mun. (4), $17,000.

INDIANA: Kisters Field, Bloomington (3), $70,000; Bendix Field, South Bend (4), $360,000.

IOWA: Fort Dodge Mun. (3), $231,517.

KANSAS: Garden City Mun. (5), $9,325; and Garnett Mun. (2), $18,700.

MASS.: Gardner Mun. (1), $37,350; North Adams (2), $108,359; Norwood (3), $9,000.

MICHIGAN: St. Clair Mun., Port Huron (3), $85,000; Jackson Mun. (3), $4,000; and Ironwood (3), $50,000.

MINNESOTA: Weld Chamberlain Airport, Minneapolis (5), $595,000; Flying Cloud Airport, Minneapolis-St. Paul (2), $45,000; Mankota Mun. (3), $175,000; St. Cloud Mun. (3), $45,000; Owatonna Mun. (2), $30,000; Duluth Mun. (4), $97,000; Fergus Falls Mun. (2), $50,000; Worthington Mun. (2), $20,000; Glenwood Mun. (1), $20,000; and Blue Earth Mun. (1), $22,500.

MISSISSIPPI: John Bell Williams Field, Jackson (4), $22,500; and Greenville Mun. (3), $6,916.

MISSOURI: Cabool Mun. (1), $19,475; and Rolla Mun. (2), $19,100.

MONTANA: Big Horn Co. Airport, Hardin (2), $6,927; Bozeman (3), $82,087.

NEBRASKA: Omaha Mun. (4), $569,970.

NEW MEXICO: Lea Co. Airport, Hobbs (3), $87,000; and Hot Springs Mun. (3), $36,018.

NEW YORK: N. Y. International Airport (7), $700,000 and $400,000; Buffalo Mun. (4), $325,889; Oneida Co. Airport, Utica-Rome (3), $36,838; Malone-Dufort Mun. (3), $3,500; and Clarence Hancock Field, Syracuse (4), $75,000.

NORTH CAROLINA: Douglas Field, Charlotte (4), $28,500; and Fayetteville Mun. (3), $31,800.

NORTH DAKOTA: New Rockford Mun. (2), $2,800.

OHIO: Port Columbus Airport (5), $135,000; and Youngstown Mun. (4), $125,000.

OKLAHOMA: Phillips Airport, Bartlesville (3), $100,000; Paul's Valley (2), $6,713; Ardmore Lake Airport, Murra (1), $6,756; Guymon New Mun. (1), $4,912; and Lawton Mun. No. 2 (3), $77,995.

OREGON: Medford Mun. (4), $6,922; Stevenson Emergency Airport, Cascade Locks (1), $3,140; and The Dalles Seaplane Base, $18,405.

PENNSYLVANIA: Johnstown Mun. (3), $70,844; New Cumberland (4), $175,000; and Avoca Mun. (4), $20,000.

SOUTH DAKOTA: Sioux Falls Mun. (4), $33,138; and Black Hills Airport, Spearfish (3), $30,835.

TENNESSEE: Knoxville (4), $73,540; Henry Co. Airport, Paris (2), $13,000 and $600; Murfreesboro Mun. (2), $26,525.

TEXAS: Big Springs Mun. (5), $37,813; and Pounds Field, Tyler (4), $110,880 and $3,012.

WASHINGTON: Paine Field, Everett (5), $21,904; Seattle-Tacoma Mun. (5), $180,091; Moon Island Airport, Aberdeen-Hoquiam (4), $32,215; Renton Mun. (4), $14,725; and Lake Wenatchee Emergency Airport (2), $26,500.

WISCONSIN: Wautoma Mun. (1), $16,000, Alexander Mun., Wausau (3), $262,000; Traux Mun., Madison (5), $30,000; and Mitchell Field, Milwaukee (5), $450,900.

WYOMING: Worland Mun. (3), $44,000.

Airport Notes

President Truman has sent to Congress requests for supplemental appropriations for payment of **claims for damages done to municipal airports** by government aircraft during the war, as follows: Bridgeport (Mass.) Municipal, $286,279; Olney (Tex.) Airport, $61,740; and Smith Reynolds Airport, Winston-Salem, N. C., $84,365 . . . Bureau of Budget has sent to Congress a supplemental estimate for $175,000 for installation of a steam line to serve the new hangars at **Washington National Airport.**

The airport commission at Jefferson, Ia., won approval four years ago for a bond issue providing just enough money to buy land for an airport, but had nothing left for construction work. Crops raised on the land for four years netted $17,808.33, and a matching Federal-aid grant will provide about $35,000 for grading, drainage and other improvements.

Cleveland Municipal Airport is acquiring an additional 500 acres of land and plans to add 1,000 ft. to all runways, bringing them to 7,000 feet. Latest improvement at the field is the Westinghouse Krypton high-intensity approach light system, which was officially dedicated last month.

St. Joseph County Airport, near South Bend, Ind., will formally open its $550,000 terminal building with ceremonies the weekend of June 11-12. It's a two-story brick building, 48 x 415 ft. A second-floor restaurant will be operated by Dobbs Houses, Inc., and there will be a coffee shop on the first floor.

The Detroit Metropolitan Aviation Authority has won final approval for its recommended Master Plan, which includes, among other projects the proposed Detroit-Windsor International Airport. Common Council of the City of Detroit is negotiating with CAA for a Federal-aid grant and the Mich. Legislature has been asked to put up $1,000,000 toward the project.

The California Aeronautics Commission is preparing a study of interest to all airport owners and operators on items such as operating budgets, field rules and zoning laws.

I. V. Packard, former director of aeronautics for the state of Nebraska, has been given a two-year contract by **Hastings, Nebr.,** to be manager and operator of the municipal airport.

PRETESTED IDEAS

Hangar Doors

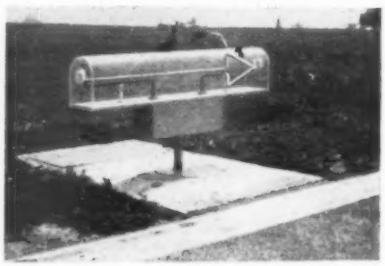
BECAUSE HE couldn't wait for delivery of permanent type doors for the T-hangars he built at his airport, Louis Mancuso, manager and owner of the airport at Deer Park, Long Island, N. Y., had some canvas doors made to temporarily protect his tenant's planes. Made of extra-heavy canvas treated with a weather and fire-resisting, and mildew-proof plastic, they are secured by slides on ½" steel cables, top and bottom, and fold accordian-style. Turn buckles are used in the door-supporting cables to keep them taut. The doors are easy to open and close and can be padlocked for additional protection.

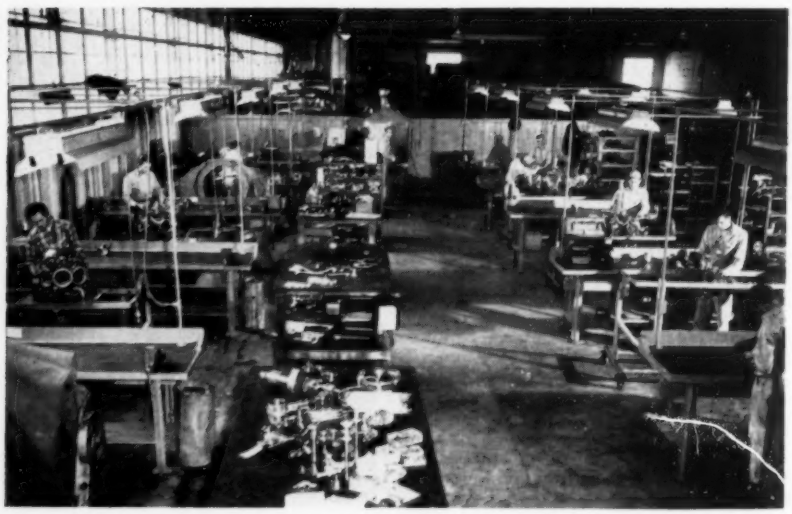
New Taxi Light For Runway Intersections

THIS EXPERIMENTAL taxi light, designed and installed under the direction of Dick Ronayne, chief of the electrical section at Washington National Airport, has received excellent comments from pilots since installation around April 1 of this year.

It consists of a blue neon arrow shaped tube (arrow points in the direction of the administration building) about four feet long and enclosed for weather protection in a clear plastic-glass housing which is easily removable for servicing by removing one screw at each end. The steel box containing the transformer supports the tubing housing and is, in turn, supported by a steel conduit nipple having a frangible joint which can be completely severed from the base on a slight impact from a plane, snow plow or field truck. A weatherproof detachable plug in the base disconnects the unit if it is knocked over.

This unit is not to be confused with the two new type taxi-way marker lights (CAA Spec. L-822—elevated incandescent type and CAA Spec. L-825—elevated "V-Shaped" gaseous tube type) or the old style semi-flush type taxi lights. In addition to this new light at Washington National, taxiway directional lines have been painted on Runway 18—36 and Taxiway No. 2 at the intersection. Ronayne reports that pilots like the combination.





Utility Pipe Framework

THIS OVERHEAD pipe framework attached to the workbenches in the final assembly department of the Engine Shop at Southwest Airmotive Co., Dallas, Tex., not only produces a neat appearance and eliminates the usual maze of drop cords, pipes, etc., but it also serves as electrical conduit and compressed air piping for serving electric power and air for plug-in at the benches. The fluorescent lighting units are also supported and fed from the conduit framework, thus placing them closer to the working plane and providing an increased intensity of illumination where it is most needed. Note the conduit fitting type electrical receptacles and the air outlets in the vertical pipe supports.

Executive Aircraft Customer Needs Better Ground Service

Corporation-owned aircraft are becoming a major sales item of aircraft distributors, an important source of business to fixed-base operators, and a growing customer of airports. There are upward of 600 such planes today, and they are in almost daily use. Are airport operators properly appreciative of the revenue potentialities of this category of traffic?

William B. Belden, assistant counsel for Republic Steel Corp. and chairman of the Corporation Aircraft Owners Association, thinks not, in most cases.

Belden says there are a number of airports that do a good job of providing adequate space, service and facilities for executive planes at fair charges, but far too many airports, in his opinion, are poor hosts to the growing fleet of corporation-owned planes.

"We are interested in speedy transportation, and anything that slows that transportation down, be it slow service, poor servicing personnel, or careless airport operation, should receive and will receive our careful consideration," said the CAOA chairman.

Continuing, Belden enumerated the services and facilities pilots of executive or corporation aircraft expect of the airports into which their business takes them.

Traffic Control: At all airports, and especially at one with which the pilot is unfamiliar, a primary need is for a cooperative tower that will provide adequate landing instructions and specific directions for taxiing and parking.

Loading Area: A special ramp designated for the use of executive planes would be desirable, but if this is not practicable some provision should be made so that such planes might load and unload (usually a matter of minutes) without ramp attendants frantically shooing them away and other aircraft "gnawing hungrily" at their rudders.

Porter Service: Passengers in corporation aircraft frequently travel with only brief cases, but there are times when they have baggage, and it would be helpful if there were some way of reaching porters. Pilots would help, but they frequently cannot leave the planes for long or other traffic would be slowed.

Ground Transportation: "There should be means at every airport of obtaining taxis or limousines promptly . . . Some smaller airports have 'courtesy cars' owned by the airport and available for use by transients at a reasonable cost. We hope more and more airports see fit to supply such transportation. On our part, we will be glad to pay for such service."

Clean Washrooms: "We would be more apt to spend more time and more money at airports if the restaurants and washrooms were clean and inviting . . . Washrooms, however, are still one of the worst problems at most airports . . . Most passengers welcome a chance to clean up or change linen before going into town . . . and this matter is of even more importance to our flight crews, who must often shift for themselves after delivering their executive passengers to their airport destinations."

Turning from those airport facilities which affect the human element in itinerant aircraft travel to those facilities required for the servicing of executive planes, Belden says such facilities, unfortunately, are not standard at every air terminal, although, as a matter of course, they should be. These include:

Parking Areas: "Are they adequate, and not dirty, dusty or muddy? Has any real attempt been made to provide adequate parking space for our planes? Too many fields shunt our ships off to areas that cannot help but impress our people unfavorably."

Tie-down Facilities: "Our aircraft represent valuable investments to us, and likewise to you as potential sources of revenue. None of us want such investments to blow away because of poorly trained or careless field men."

Fueling Service: "The fueling of our planes is of paramount importance to us. We would like to have it done promptly and sufficiently at fair and reasonable rates. We would like particularly to have the fueling handled by considerate personnel."

Maintenance: "Maintenance facilities available at terminals must be manned by experienced employes who know how to use them. Poor maintenance is far worse than none at all, and a lot more expensive."

Fair Prices: "Executive aircraft operators, being first of all business men, are quick to spot and recognize fair prices for good service rendered. We like to land at ports where the service is fast, efficient and fairly priced. We do not pinch pennies, but we believe in getting our money's worth."

Belden said his group thinks the increasing use of executive planes is a boon to aviation progress, and that the improvement of airport facilities and services can be a tremendous factor either to encourage or to discourage the continued growth of this type of airport traffic.

The operators of executive aircraft, he said, "will be among the first to recognize, not only with praise, but also with cash, good airport hosts the nation over."

Soundproofing Kits Reduce Noise Level in Swift

A soundproofing kit which will reduce noise levels in the Swift 125 as much as 12-13 decibels in the high frequency bands has been designed by Texas Engineering and Manufacturing Co. in conjunction with Wayne Rudmose, electro-acoustic consultant. Now in production as optional equipment for new airplanes, the soundproofing kits will soon be available in package form for field installations.

Included in the kit are stainless steel muffler assemblies and a sealing set for the "cabin-type" Swifts with metal hatch

More Aileron—This view of Cessna's new model 140 offers an excellent look at the additional aileron area which gives the ship "finger tip control". The new model is being marketed with either an 85 or 90 hp. engine which enables speed of 110 mph cruising or 125 mph top speed. The 140 is a two-place model with a fuel capacity of 25 gallons and a range of 4½ hours. It features all metal construction, semi-cantilever wings, hydraulic brakes and full swivilling, steerable tail wheel.

and metal frame sliding windows. The muffler set includes two Hanlon-Wilson stainless steel heater-mufflers, Airtron tubing and engine cowling close-out plates. Total weight is six pounds. Temco engineers claim the arrangement increases heater efficiency in addition to lowering the noise level.

Remmert-Werner at WNA

The Remmert-Werner Corp., which for the past three years has conducted a fixed-base operation at Lambert Field, St. Louis, has leased Hangar 9 at Washington National Airport and expects to provide complete aircraft services there for both transient pilots and locally-based planes.

Services offered at Washington include: hangar storage; 24-hour line service; all aircraft maintenance and repair; complete modification on all type aircraft; sale of aircraft parts and accessories; sale of aviation gasoline (Shell) and oil; custom conversion on large aircraft; washing and polishing of aircraft; and installation, service and sales of aircraft radio equipment. In addition, the company will offer sightseeing and charter flights.

Joe Werner, one of the partners, will give most of his time now to the Washington operation. He will be assisted by William M. Matthews, formerly with Reading Aviation Service.

Busy Grand Central—This aerial shot of one of the overhaul ramps at Grand Central Airport, Glendale, Calif., indicates a high level of activity. Few personal and business type planes appear in this photo, although Grand Central is one of the largest personal plane fields in Southern California and does a brisk business in executive type plane service, conversion and overhaul.

Planes on the ramp include DC-3's, six of which are being converted for All American Airways and five of which are being reconditioned for Aerovias Reforma, Mexican Air Line; two of the six PBY's being reconditioned for the Brazilian Air Force; two of the Chinese Central Air Transport Corp.'s five Convair-Liners in for radio installation; 18 of the 100 C-46's being reconditioned for the U. S. Air Force; and one of two B-25's being overhauled and re-fitted for the Chinese Air Force.

Briefing the News

Iowa plane owners get a break from recent legislation cutting private aircraft registration fees 25% for the second year of ownership to compensate for depreciation. The Iowa fee, 1½% of the plane's list price, heretofore has applied for the first two years. Also by act of the legislature, all funds from Iowa aircraft registration fees will hereafter be used for general aviation purposes, rather than to have unexpended balances revert to the general fund at the end of the fiscal year.

Wayne Weishaar, secretary of the **Aeronautical Training Society,** reports that enrollment in aviation technical schools is up 10% to 15% since the first of the year. He also noted that U. S. Dept. of Labor's new "Occupational Outlook Handbook" forecasts good employment prospects for airplane mechanics between now and 1950.

New York City's first helioport was officially opened May 18 at Pier 41, East River. **Metropolitan Aviation Corp.** is the operator . . . **Grand Central Airport Co.,** Glendale, Calif., has promoted **Glenn Fogg** to purchasing agent for Grand Central and Cal-Aero Technical Institute.

The fourth annual **Mississippi goodwill air tour** is scheduled June 2-5, with **Standard Oil of Kentucky** again furnishing gas for all planes participating . . . The 8th annual **all-Ohio air tour** is scheduled for July 22-23-24, with governors of all 48 states invited to attend or send representatives . . . An international air race from Montreal to Miami and a transcontinental race from California to Miami will be among the high lights of the **All Woman Air Show** to be held at Miami on June 4-5, sponsored by the Florida chapter of the Ninety-Nines.

Aviation Sales and Service

By Robert C. Blatt

Early Bird Rates: By offering bargain prices during normally idle periods, operators can increase the daily utilization of their equipment and get the cost of flying time down in the low brackets. For example, Claude Dilworth, operator of the Dobbs Ferry Seaplane Base, has recently announced an "Early Bird" rate of $12.50 from 7 A. M. until noon, except on weekends and holidays, for Luscombes on floats. You buy the gas. All arrangements for planes must be made at least 12 hours in advance.

Hawthorne Flying Service at Orangeburg, S. C., successfully operated a daily "Matinee Rate" before 1 P. M., which provided a "bonus" of 5 minutes for every 30 minutes of flying time. This special rate was abandoned when the G.I. Program started.

Flying Aids Job Seekers: *Operators should lose no time in capitalizing on the results of the survey now being conducted by the Personal Aircraft Council of the Aircraft Industries Association of America. The survey indicates that the ability to pilot an airplane is an important qualification when applying for a job in many industries today. Over 95% of the executives who replied to the questionnaires stated that the ability to fly would be a definite advantage in the employee's career.*

This provides the operator with additional "ammunition" for promoting flight instruction and combating the theory that flying is in the same category as "ballroom dancing".

Runways as Racetrack?: We have heard of lots of ways to bring crowds of people out to the airport, but here is a new one. A stock automobile race was planned at Great Bend, Kan. airport for Memorial Day. A purse of $2,000 was involved and a crowd of 15 to 20 thousand expected. The runways were the racetrack and taxiways and ramps used for the auto parking area. Free tie-down was provided for visiting pilots. A neat profit was anticipated with admissions at $1.25 for adults, and 60 cents for children—also from all types of concessions.

Birds on Runways: *Since we have done a lot of talking recently about how to get rid of birds in hangars, we would like to hear from operators and managers on how they cope with the problem of birds on the runways. This is quite serious at many fields—especially those located near water.*

Miller Back With Piper: Jake Miller, well known Piper sales manager for many years, is back—as domestic sales manager. He left Piper last summer to go with Ryan Aeronautical as a special field representative.

Auto-Plane Showroom: *Nearing completion along Route 28 on the main highway near Somerville, N. J., a unique Auto-Plane Showroom will be operated by veteran pilot, Thor Solberg, operator of the Solberg-Hunterdon Airport some 2½ miles away. The idea is to take trade-in autos for airplanes and vice versa, also to service and sell parts and accessories for both. A flight strip for the showroom customers is also under construction nearby. This combination may have what it takes to sell airplanes these days.*

New Sprayer Approved: Aeronca's newly-developed Sedan "Load Master" Sprayer has recently received CAA approval. The spray unit, developed by the Sevdy-Sorenson Co., of Worthington, Minn., and at present available only from the Dakota Aviation Co., Huron, S. D., costs $785, with installation estimated at $40. A six-way baffled 100 gallon capacity tank is located directly behind the two front seats, placing it well within the CG limits under all load conditions. Very little modification is necessary to the basic airframe. The pressure pump is wind-driven and the fan rpm can be reduced to less than 200 for cross-country. It would appear that this type plane-spray combination will be a real money-maker for operators.

The Birdmen's Perch

By *Major Al Williams*, ALIAS, "TATTERED WING TIPS,"
Manager—Gulf Aviation Department, Gulf Bldg., Pittsburgh 30, Pa.

They're still scrapping about those two de luxe private planes.

Champions of the two similar-but-different 4-place, $10,000 class planes got to snarling at each other about take-off run, landing characteristics, climbing speed, etc. So they set up a contest at Albuquerque (altitude: 5365′) to prove which was the better plane.

One plane took off (no load but pilot and full tanks) in 330′ . . . landed in 348′ over a 7′ obstacle. The other got off in 395′ . . . got back in 402′ over the obstacle. The latter plane had about 3 miles more wind, according to the tower.

But all over the country, every owner or pilot of these two types of planes is screeching why the test was (or wasn't) a fair one. And offering to prove it!

Of course, arguments like this one are one of the most delightful parts of this flying business.

But even more delightful is comparing *either* of these airplanes to planes in the same class 10 or 15 years ago!

Yessir, this is a swift business!

REPORT CARD

Been getting more reports from operators and owners around the country on Gulfpride Aviation Oil—Series D.

They tell us that this great new oil for horizontally opposed engines has helped them boost overhaul periods to over 1000 hours!

They say the detergent qualities of Gulfpride Aviation Oil—Series D—practically eliminate stuck rings and valves.

They've found that the dispersent characteristics let them use Series D in clean or dirty engines . . . that foreign matter in the engine stays in suspension in the oil until it is drained off at changes.

And sure enough . . . just like we've

said for years . . . they've discovered that Gulf's exclusive Alchlor Process gets more of the non-lubricants, more of the impurities out of Gulfpride Aviation—Series D—giving them more honest lubrication per quart of oil!

It's the world's finest oil for horizontally opposed engines.

Better use it.

LITTLE KNOWN FACTS DEPT.

Lt. Comdr. Sheldon Kinney, Naval Base, South Carolina: *Thank you for your Fact. Now if you'll send proof, we can use it.*

J. R. Crandall, Springport, Indiana: *Ditto above.*

Roy E. Kelly, Chief Technician, Treasury Law Enforcement Agencies, Bethesda, Md.: Thank you for an interesting Little Known Fact. Thanks for the proof, too. Your Commission as Perch Pilot (bottom rung) is on the way for:

"In 45 hours 15 minutes flight time, a Coast Guard piloted L5 recently smoked out 142 moonshine stills in a single state, involving $60,000 in tax frauds, plus much more in fines and penalties!"

That's all there is to it, gents. One Little Known Fact plus one proof of same equals one Commission as Perch Pilot (br). Five of 'em get you promoted to Senior Perch Pilot.

And 20 of 'em (gasp) make you a Command Pilot!

The address is up on top there.

Revenue for Some:

Airlines Divided on Accepting Advertising in Timetables

By Eric Bramley

One airline is covering more than half the monthly cost of printing its timetables through revenue from outside advertising, and three others are now or will be accepting such advertising, but a majority of the airlines still do not consider it an advisable practice, an American Aviation survey shows.

Capital Airlines will hit a new high in its June timetable, which will contain 15 ads. The revenue from these ads will pay an estimated 54% of printing costs. National Airlines is accepting advertising, Southwest Airways and Trans-Texas Airways will adopt the practice shortly, and TWA is "actively considering" it. A few others are interested, and are looking into the matter.

Most companies, however, state that (1) they'd sooner use timetable space to advertise their own services, and (2) they don't believe available advertising would cover enough of printing costs to make it worthwhile.

Austin for It. Obviously not agreeing with the majority is James W. Austin, Capital's vice president-traffic and sales, who reports that in June the ads will pay about $700 of a $1,300 printing bill. Capital's ads are handled through The Kellogg Group, Rockefeller Center, New York, an agency headed by O. W. Bartlett. It has also handled timetable ads for several large railroads and the Pullman Co.

"The Kellogg Group sells the advertising, subject to Capital's approval, and they remit 60% of the gross to Capital," Austin said. "Cuts, production costs, etc., are paid for either by the advertiser or The Kellogg Group. The 60% figure is net to Capital. Advertising has been appearing in our timetables for almost two years and during that period, we have collected a rather substantial sum of money."

Capital's timetable circulation is guaranteed at 100,000 monthly, and the following ad rates are charged: one-fifth column, $60; one-fourth, $75; one-third, $100, and back cover, now sold to *Esquire* magazine), $275.

Answering some of the points brought up by those who do not favor advertising, Austin said that if Capital took out all the ads, it wouldn't be able to get along with less pages in the timetable. He also maintained that an airline does not have to sell itself throughout the timetable, adding that the ads make it more interesting and readable.

Asked if the 60-40 deal with Kellogg is satisfactory, he said it was the "best possible available," and that they are "good people to deal with." Austin's position is that $700 a month is not to be sneezed at, and he'll take all the ads he can get, within space limitations.

Some Undecided

Airlines that accept advertising, or have not made a decision yet, or are investigating, include:

National Airlines: NAL's current timetable carries two Miami hotel ads. Space is handled through an agency.

Southwest Airways (Michael Cole, general traffic manager): "We contemplate such a move in the future, and advertising will be handled through our own organization. . . It has been our feeling for a long time that the timetable should be combined with some interesting chatter, photographs, etc., so that it would perform the function of being something for the passenger to read aboard the aircraft as well as carrying some interesting reading matter concerning the airline itself." SWA believes the ads can "bring in sufficient revenue to offset a substantial part of printing costs."

Trans-Texas Airways (Stanton B. Danilow, assistant to president): "Such a move . . . is contemplated in the near future. The advertising will be handled through an agency."

TWA (James De Long, advertising director): "We are actively considering acceptance of advertising . . . but have not reached a final decision as yet."

Continental Air Lines (Stanley Halberg, general traffic and sales manager): The company has not accepted ads, but has been having correspondence with a New York agency. "Generally speaking, we are for . . . advertising and feel that it should bring in sufficient revenue to offset a substantial part of the printing costs."

Mid-Continent Airlines (Hugh Coburn, vice president-traffic and sales): MCA has not accepted ads, but has been in contact with a New York agency. "We believe our present use of the space is extremely valuable to us and, though we are still seriously considering outside advertising, we have made no decision for or against it at this time."

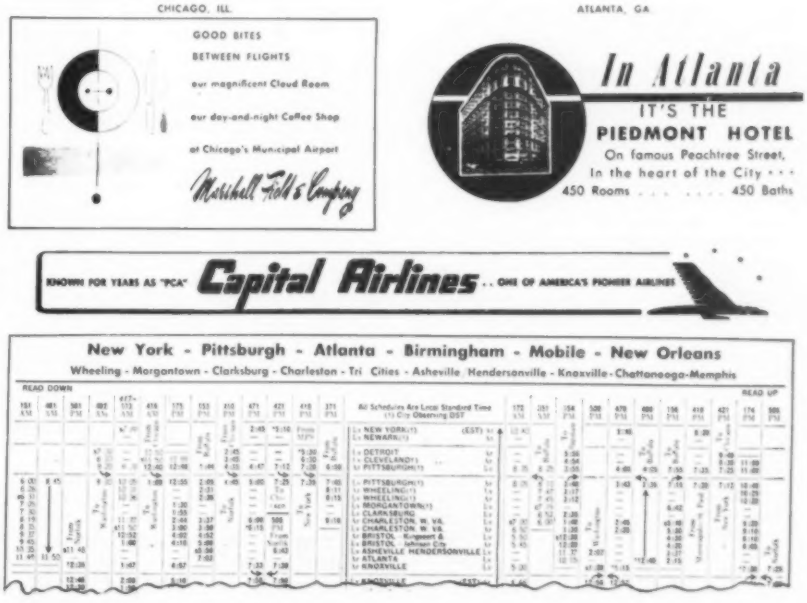
Western Air Lines (Kenneth E. Allen, director of advertising and publicity): "Western . . . is in favor of advertising . . . and we will probably go into (it) before the year is out. I think we will handle this through our own advertising department rather than through our . . . agency."

All American Airways (Dave Miller, traffic and sales director): AAA is finding it "much cheaper" to multilith timetables in its own shop. If a change is made, ads will be considered.

Piedmont Airlines (C. G. Brown, assistant general traffic manager): Company is now experimenting with "vest pocket" timetables, which have no room for ads. If it decides regular-size scheduled are more desirable "we will probably accept outside advertising."

12 Airlines Opposed

The airlines that do not accept ads



TIMETABLE ADVERTISING like this pays for more than half of Capital's printing bill.

and do not contemplate adopting the practice include:

American Airlines (R. E. S. Deichler, vice president-sales): "We don't believe it is desirable."

United Air Lines (Harold Crary, vice president-traffic and sales): "We look upon a time table as a piece of sales literature, and if any additional space should open up we feel we could effectively use it to exploit some of the destinations to which we are stressing transportation . . . to accept . . . advertising we would have to increase the size of the timetable by four pages and we doubt if the income . . . would offset that increased production cost."

Eastern Air Lines (M. Lethbridge, assistant to vice president): "Once we turn to public advertising, we lose a great deal of liberty in the format of our timetables, as each advertiser usually makes a commitment binding for 12 months. A recent study . . . indicated to us that the latitude and freedom that we presently enjoy in the production of our timetable, in which we do our own advertising, incidentally, more than warrants the expense that would be defrayed by accepting public advertising."

Northwest Airlines (J. M. Cook, director of advertising): "We do not believe that, at the present time, the amount of advailable advertising . . . would offset financially the advertising value of the timetable to the airline for the promotion of its own services. We believe that the . . . timetable is one of our most important and effective means of advertising . . ."

Braniff Airways (Rex Brack, general traffic and sales manager, domestic): "Our . . . timetable is . . . our number one sales piece and . . . it should be exclusively our own catalogue of service and sales items . . . There is no alien copy to confuse the passenger . . . Our best sales piece deserves this one-company treatment."

Chicago & Southern Air Lines (T. M. Miller, general traffic and sales manager): "We found an agency in New York which would solicit advertising . . . for a fee of 40% . . . This would mean . . . net income to C&S (of) about $5,000 a year. This . . . would cover approximately 25% of the cost of producing our timetables." If C&S printed a larger quantity, and advertising would cover almost all costs. "it would probably be a good thing," but 25% doesn't justify giving up space "we can use to advantage ourselves."

Northeast Airlines (George Soctt, general sales manager): NEA doesn't accept ads "except for a tie-in deal with Hertz U-Drive-It and Waltham Watch. Our feeling is that the timetable is our most effective direct mail sales piece . . . This effect . . . would be lessened by . . . inclusion of other advertising."

Colonial Airlines (Alfred Hudson, vice president): Colonial has considered the matter four times in the last 10 years, but to date "sufficient savings could not be effected to warrant our giving this matter further consideration." If it were possible "to have our timetable requirements met by some agency without any charge at all to the company, and certain restrictions were placed upon the type of advertising . . . I believe that we would be interested . . ." He added that some advertising might prove embarrassing. For example, if one large New York hotel advertised, and others didn't, "it would prove a little embarrassing to ask the hotels who were not advertising to distribute our timetables to their customers . . ."

Challenger Airlines (G. S. Kitchen, traffic and sales manager): Challenger has no room for ads in its pocket-size schedule, but Kitchen said, "I personally favor . . . advertising, providing it is limited to those companies who are closely associated with the airline industry, such as hotels, resorts, etc. It should represent a considerable saving to the airlines . . ."

Empire Air Lines (Gwin Hicks, vice president-general traffic manager): Although Empire won't adopt the practice at the present time, "we believe that . . . advertising has some merit."

Pan American Airways (W. H. Risley, assistant to vice president-traffic and sales): "We do not believe (it) is desirable."

Pan American-Grace Airways (Nicholas Craig, sales manager): "Our reaction . . . is that it is not desirable."

Capital's Jim Austin Gains Quick Recognition as Top Salesman

It is a little unusual for a newcomer in the air transport industry to gain industry-wide recognition and a vice presidency in three short years, but such are the accomplishments of James W. Austin, vice president-traffic and sales for Capital Airlines.

Joining Capital early in 1946 after coming out of the Air Transport Command (and all his experience before the war had been in banking), Jim Austin has boosted the company's non-mail revenues substantially through the persistent belief that air transport must be *merchandised* and not merely offered for sale.

Going the old "build-a-better-mouse-trap" theory one better, Austin keeps promoting the idea that you've got to put the better mouse-trap right on the customer's doorstep, all wrapped in the most attractive package possible.

Austin has insisted that it's fare not fear that keeps people off airplanes, and has repeatedly emphasized that "if you put the right price tag on air travel, the masses of the traveling public will buy it."

Fresh Ideas. To reach the vast potential of airline traffic not heretofore tapped Austin's department has introduced a number of new ideas and techniques, backed up by the largest and most concentrated advertising campaign in the company's history.

The results speak for themselves. Capital's passenger traffic in the first quarter of 1949 showed a 21% increase, compared to an industry average increase of 15.8%. The company's non-mail revenues for 1948 totaled $17,943,745, as against $15,850,149 in 1947; and non-mail revenues for the first four months of this year amounted to $5,946,517, compared to $4,750,271 in the same four months of 1947 and $4,100,334 in the comparable 1946 period.

While no single individual probably can claim the credit for originating Capital's enormously successful "Nighthawk" air coach services, there is no question but that the advertising of these services, directed by Jim Austin, has constituted an outstanding airline promotion effort.

Believing that coach-type service is the industry's best hope for driving a major wedge into the mass travel market, Austin pushed it through every conceivable media and every promotional gimmick, ranging from standard billboards and subway ads to laundry wrappers and auto bumper placards. The success of this operation is too well known to bear repeating here.

Tops With Charters. Overlooking no revenue possibilities, Jim Austin has done an outstanding job in the development of charter business. Capital led the industry in production of this type of revenue last year with more than $300,000 in charter fees, and already in the first four months of 1949 has tripled the revenue produced in the same period in 1948.

Interline and agency business also has been boosted under Austin. In 1946, for every dollar that Capital gave other airlines, it got back 57c from them in interline business. Austin set out on an educational campaign to convince the other carriers that Capital was one of their biggest customers and that if they intended to retain the business of this customer they would have to reciprocate by placing an equal amount of business for that received.

The idea caught on, with the result that by 1948 Capital was getting back 75c for every $1 worth of business it gave to other airlines, and Austin believes that 90c is going to be the figure for 1949.

Selling Capital's cargo services in the face of the handicap of its short-haul route structure, Jim and his salesmen last year boosted Capital up to third ranking in poundage carried by scheduled domestic carriers.

Merchandising standard airline service at $2.50 for a 30-minute flight, Capital's traffic and sales department under Austin has won remarkable public acceptance of its Sunday sightseeing flights at route points where equipment lays over on week ends for a day or even for a few hours.

Costs Held Down. It all adds up to the fact that Austin is a top-flight salesman and has done a lot for Capital reve-

nuewise. But "Salesman Jim," as he is known around Capital, is proud not only of the revenue his department generates but also of the low cost at which it has been produced.

Traffic and sales expenditures of the company in 1946 were $2,515,444 and in 1948 they were $2,520,699, an increase of only about $5,000 despite wage increases and the fact that Capital during that period opened service to 12 new cities. In 1946, the company had 1,367 persons in all sales activities; today it has only about 550. And the revenues are higher.

Austin also likes to point out that Capital's advertising acquisition cost per passenger last year was 81.5c, against an industry average of 99.7c. Effective use of the direct mail technique has helped keep these costs down for Capital.

Common Carriers Lose Ground to Auto

Airline passenger traffic is gaining over Pullman traffic but all common carriers combined—airlines, railroads and buses—are losing ground to the private automobile in inter-city traffic, according to a survey made by Dr. Lewis C. Sorrell, director of economic research, Air Transport Association.

The survey revealed that the division of inter-city passenger traffic between the private and common carrying facilities of the country is again approaching the stage that prevailed before the war, when the private automobile accounted for some 86.8% of the total passenger miles and the common carriers divided among themselves the remaining 13.2%.

The passenger automobile last year had an estimated total of 293,188,000,000 passenger miles, or about 82% of the national total. Of the 64,315,000,000 passenger miles of the common carriers 23 billion were operated by inter-city bus lines, 24.4 billion by rail coach, 11,100,000,000 by Pullmans and 5,815,000,000 by the 16 domestic trunk airlines.

Bigger 'Class A' Share. Airline passenger miles were down some 3% from the 1947 figure, but Pullman traffic declined about 10% in the same period, with the result that the airlines' share of the combined Pullman and airborne passenger traffic—sometimes referred to as the "Class A" travel market—rose from 32.90% in 1947 to 34.38% last year.

Equated to the same mileage basis (expanding air passenger miles some 20% in order to allow for the greater distances between traffic centers which rail travelers must traverse), last year's air traffic represented about 38.8% of the Class A travel market.

Revenue-wise, the 16 trunk airlines received about 42% of the combined passenger revenues from Pullman and airborne passengers.

Over the Counter

By Eric Bramley

Sales Promotion

THREE airline employes have already won all-expense vacations on a Rocky Mountain dude ranch by participating in **Monarch** and **Challenger Airlines'** contest. Traffic, reservations and passenger service personnel of any airline can compete. All you have to do is send in your answer to: "What can your passengers expect to see and do when they fly Monarch and Challenger Airlines' Scenic Skyways of the West?" See **Official Airline Guide** for details. Winners so far are Dawson P. Adams, United Air Lines, traffic, Chicago; Ross Byers, Braniff Airways passenger service, Dallas, and William F. Grady, Eastern Air Lines, reservations, New York. The feederlines hope to promote a substantial amount of interline business through the contest . . .

An unusual interline sales promotion idea is that being used by **Tom Dempsey, Continental Air Lines'** interline and agency sales manager. He is recording personalized talks on interline sales, directed to sales and reservations personnel of connecting airlines, and highlighting connecting services between Continental and other carriers. To date he's made recordings for 10 cities along TWA's system, and is working on similar platters for other airlines whose flights connect with Continental.

A letter from **William Spencer**, of **Continental Air Lines**, regarding an item in the April 15 column on the nice letters from passengers which **Challenger Airlines** copies and circulates among its employes under the heading "Orchids to Challenger." Spencer claims Continental has been doing this for over three years to improve morale and develop better passenger service. But, he says, they not only circulate the good letters, entitled "Orchids to Continental," but the bad ones as well, the latter under the heading "Behind the Eight Ball."

United Air Lines' traffic department has launched an "all-out" campaign to promote increased passenger traffic over the New York-Cleveland-Chicago route. **B. B. Gragg**, UAL traffic and sales director, states that "Class A business is moving between these cities in large volume. First-class trains are full, but our share of the business is below par. The business is there—we simply must make an increased effort to get it" . . . **United** is going to give $10,000 worth of prizes to employes for the best letters on "How I Can Help Sell United." The contest idea is spreading. **Eastern**, we believe, was the first to use it . . . **TWA** is distributing a 15-page booklet, entitled "A Day in Rome," to 42,000 members of the Catholic clergy and Catholic groups throughout the country. Company is looking forward to increased business in 1950, when Holy Year activities of the Catholic Church will be held in Rome.

Capital Airlines, which has been concentrating on improving telephone sales technique, has been making sure that the lessons learned from its check call skit aren't forgotten. Every week, the company's "Sales Magician" in Washington makes phone calls to points on the system and asks questions about Capital's service. Agent that does the best job during the week is sent a check for $25. Credit for the idea goes to **Stu McAlister**, Capital's director of properties.

New Services

TACA Airways on May 16 inaugurated direct non-stop DC-4 passenger-freight service between New Orleans and Guatemala City, with initial frequency of five flights weekly. Flights continue on to San Salvador, El Salvador.

TWA on May 31 was to begin operation of one daily round-trip sky coach flight between New York and Chicago via Pittsburgh using Boeing Stratoliners. Departure from each end will be at 11:45 p.m. New York-Chicago fare, $29.60 plus tax. No advanced reservations or round-trip reductions.

All American Airways on May 15 opened passenger-mail-cargo service to Wildwood, N. J., on its route from Washington-Baltimore to Wilmington-Philadelphia via Easton-Cambridge, Salisbury, Georgetown and Dover.

Traffic

NATIONAL Airlines is opening downtown reservations, ticket and cargo offices at 15th and Walnut, Philadelphia. In Norfolk, central office is being moved from Thomas Nelson Hotel to Monticello Hotel . . . April was second best month in **Pioneer Air Lines'** history. Company boarded 9,675 passengers (exceeded only by 10,131 in October, 1948), 64,249 lbs. of air mail, 20,438 lbs. of air express and 35,240 lbs. of air freight . . . **Northeast Airlines** carried 25,945 passengers in April compared with 22,232 in same month last year and 19,654 in March, 1949. Revenue passenger-miles were 4,829,184 against 4,117,498 and 3,710,862, respectively . . . **Pan American Airways** on June 3 will add 16 summer excursion fares between New York and Colombia and the Canal Zone, averaging 30% less than normal fares. Company also starting low-cost trips from New Orleans and Mexico City to Guatemala City, San Salvador, Managua, San Jose, and Tegucigalpa.

Lockheed Underwrites Cost Of Perishables Research

Aiming to remedy problems arising from the trial-and-error basis heretofore used in development of the growing air cargo volume of cut flowers, Lockheed Aircraft Corp. has agreed to underwrite the costs of a research study on the subject.

The tests are to be under the direction of Dr. B. A. Rose, in charge of mechanical research for Lockheed, and L. R. Hackney, sales engineer. They will follow the general pattern of recently-completed experiments with fresh fruits and vegetables.

The program calls for a complete series of tests of simulated flight conditions, including the effect of altitude, temperature and humidity; a similar study comparing various types of containers, including packaging, weight, durability, leakage, labeling, shifting, etc.; and comparisons of packaging materials, weight losses, shrinkage, contamination and other elements in connection with flower shipments.

Assisting in the study will be the U. S. Department of Agriculture, the Air Cargo Institute of California, and the Southern California Floral Association, with the latter furnishing flowers for the tests. Findings from the study are expected to greatly stimulate the flower traffic, which already has become a big portion of west-east air freight tonnage.

Cargo Handling Economies Aim Of New Transit Van Corp.

A new organization with equipment and a system that may aid the fast-growing air freight industry has been formed by the North American Car Corp. of Chicago and the Hodges Research and Development Corp. of Redwood City, Calif. It is called the Transit Van Corp. with headquarters in Redwood City.

Nucleus of the company's program are certain developments, including equipment and methods of use, which were created over a period of several years by the Hodges company. Consisting of interchangeable and standardized containers and accessories, the equipment is being developed to be readily transferred from one mode of transportation to another; that is, from rail to truck, truck to aircraft, aircraft to rail or ship, etc.

Transit Van officials claim use of this equipment affords considerable economies and efficiency in cargo movement and handling, in effect extending the process of transportation so that it begins actually inside the shipper's warehouse or shipping department and carried through, without breaking bulk or rehandling the lading, to the point of ultimate distribution.

Broad Aims. The equipment is said to have wide application in many commercial fields, including the shipment of general merchandise, as well as meat, farm produce and other perishables. It also has many uses in connection with transportation, handling and storage of military supplies. The amount of misdirected cargo can be reduced, and damages caused by handling and by delays at interchange can be eliminated, it is claimed.

A prime advantage, according to Transit Van officials, is that the equipment is designed to accommodate half-carload or third-carload shipments, permitting a shipper to tailor each consignment to meet marketing conditions.

The new company's officials include several big names in civil and military aviation, as well as in the field of surface transportation. President is John R. Alison, whose resignation as Assistant Secretary of Commerce for Air was accepted last month. Fred L. Anderson, formerly a major general, Assistant Chief of the Air Staff, U. S. Air Forces; Deputy Commander, U. S. Strategic Air Forces in Europe; Commanding General, 8th Bomber Command, European Theater, and recently president of the Hodges Research and Development Co., is chairman of the board.

Certificated Airlines Pass Non-Skeds In '48 Freight Volume

Including both freight and express, the air cargo volume of the domestic certificated trunklines last year exceeded 100,000,000 ton-miles for the first time, and air freight volume alone was nearly 50% above that of the major non-scheduled all-cargo lines, according to figures submitted to the Senate Interstate and Foreign Commerce Committee by Joseph J. O'Connell, Jr., chairman of the Civil Aeronautics Board.

O'Connell's figures, shown below in tabular form, gave the 16 certificated carriers a total of 70,437,811 freight ton-miles in 1948, for a 46% edge over the 48,115,218 ton-miles of the non-sked cargo lines. With 29.8 million ton-miles of air express added in, the cargo volume of the certificated trunklines was more than twice that of the non-certificated carriers.

The postwar trend of air freight volume, quarter by quarter, is shown below:

Freight Ton-Miles of Certificated Lines and Non-Skeds

	16 Certificated	9 Non-Certificated*	Total
1946			
1st quarter	1,332,485	669,536	2,002,021
2d quarter	2,564,767	3,361,356	5,926,123
3d quarter	4,971,035	7,421,791	12,392,826
4th quarter	9,817,505	13,730,927	23,548,432
Year 1946	**18,685,792**	**25,183,610**	**43,869,402**
1947			
1st quarter	8,204,396	9,868,837	18,073,233
2d quarter	7,739,683	10,214,929	17,954,612
3d quarter	8,366,355	12,287,446	20,653,801
4th quarter	14,560,264	15,037,850	29,598,114
Year 1947	**38,870,698**	**47,409,062**	**86,279,760**
1948			
1st quarter	13,618,521	13,082,769	26,701,290
2d quarter	16,696,892	12,847,550	29,544,442
3d quarter	17,829,768	10,634,348	28,464,116
4th quarter	22,292,630	11,550,551	33,843,181
Year 1948	**70,473,811**	**48,115,218**	**118,553,029**

* Includes Air Cargo, California Eastern, Flamingo Line, Flying Tigers, Mutual, Riddle, Slick, U. S. Airlines and Willis.

Cargo Guide for Shippers Issued by American

The first issue of a comprehensive international air cargo shipping guide is now being distributed by American Airlines to exporters, importers and other interested parties. The guide will be published henceforth in four issues a year, on Jan. 1, Apr. 1, July 1, and Oct. 1.

In addition to rates and routes for shipments from the U. S. to any airline point in the world, the booklet carries a section of general tariff information, lists international shipping document requirements generally and by country of destination, and gives the addresses and telephone numbers of all American Airlines cargo offices in this country.

American Airlines recently moved what it believed was the largest air freight shipment in the history of commercial air transportation when it helped the American Safety Razor Corp. supply all its 150,000 retail outlets simultaneously with a new type of razor blade. Volume involved was 25,000,000 blades weighing 112 tons. American used 12 all-cargo planes and cargo space of its DC-6 and Convair fleets to move the shipment. Six other airlines carried parts of the shipment to points off AA's system.

U. S. Domestic Airline Traffic for March

Airlines	Revenue Passengers	Revenue Passenger Miles	Available Seat Miles	Passenger Load Factor	Mail Ton-Miles	Express Ton-Miles	Freight Ton-Miles	Total Ton-Miles Rev. Traffic	Available Ton-Miles Flown	% Available Ton-Miles Used	Revenue Plane-Miles	Scheduled Miles	% Scheduled Miles Completed
				%									
American	248,230	116,421,000	181,818,000	64.03	795,455	352,889	2,987,186	15,570,955	25,494,095	61.08	4,489,062	4,385,183	98.36
Braniff	48,914	16,173,000	31,116,000	51.98	90,697	61,553	89,222	1,790,160	3,778,818	47.37	971,678	976,040	99.30
Capital	79,368	22,613,000	52,837,000	42.80	80,250	103,559	676,749	3,020,194	6,993,072	43.19	1,633,949	1,630,975	97.79
Caribbean	8,815	620,000	1,370,000	45.26	776	. . . .	2,659	53,053	127,829	41.50	55,943	56,247	99.12
C & S	25,228	9,325,000	16,542,000	56.37	45,905	45,544	43,230	1,028,708	1,921,054	53.55	640,302	637,772	98.81
Colonial	12,349	3,315,000	5,992,000	55.32	8,864	2,762	11,096	357,008	773,703	46.14	286,027	288,561	97.96
Continental	14,524	5,096,000	13,038,000	39.09	16,331	7,167	29,561	541,047	1,346,706	40.18	501,846	499,663	99.77
Delta	48,751	21,616,000	32,826,000	65.85	85,533	53,533	137,116	2,361,536	4,523,446	52.21	1,144,947	1,139,449	99.80
Eastern	200,411	102,538,000	163,640,000	62.66	472,550	259,633	989,973	12,417,465	24,845,135	49.98	4,873,049	4,839,549	99.37
Hawaiian	23,030	3,157,000	4,709,000	67.04	4,354	11,682	39,356	324,774	545,762	59.51	213,887	190,983	98.74
Inland	5,955	2,024,000	4,085,000	49.55	8,510	4,163	8,318	214,713	418,827	51.27	210,518	212,350	98.92
NCA	28,465	8,622,000	14,786,000	58.31	26,913	14,822	31,591	899,308	1,584,254	56.77	704,113	702,150	98.82
National	29,861	17,668,000	34,036,000	51.91	61,562	59,458	157,720	2,083,836	4,813,057	43.30	836,114	815,211	98.87
Northeast	19,774	3,716,000	9,904,000	37.52	8,425	4,231	20,383	368,567	998,952	36.90	300,907	330,228	90.28
Northwest	47,975	23,867,000	49,471,000	48.24	203,347	92,013	527,657	3,170,277	6,159,922	51.47	1,378,595	1,395,123	97.75
TWA	108,075	69,280,000	131,864,000	52.54	829,990	311,981	1,142,215	8,947,683	16,871,445	53.03	4,423,032	4,246,767	98.79
United	156,014	90,570,000	143,884,000	62.95	862,227	421,058	2,255,567	12,232,272	22,144,815	55.24	4,074,742	4,030,026	98.86
Western	24,805	8,489,000	16,859,000	50.35	36,789	20,872	45,167	916,210	1,827,826	50.13	513,538	505,808	99.59
TOTALS	1,130,544	525,110,000	908,777,000	57.78	3,638,478	1,826,920	9,194,766	66,297,766	125,168,718	52.96	27,252,249	26,882,085	98.70

U. S. Feeder Airline Traffic for March

Airlines	Revenue Passengers	Revenue Passenger Miles	Available Seat Miles	Passenger Load Factor	Mail Ton-Miles	Express Ton-Miles	Freight Ton-Miles	Total Ton-Miles Rev. Traffic	Available Ton-Miles Flown	% Available Ton-Miles Used	Revenue Plane-Miles	Scheduled Miles	% Scheduled Miles Completed
				%									
All Amer. *	809	93,000	962,000	09.65	4,288	3,066	. . . .	16,415	106,255	15.45	184,076	192,910	94.29
Challenger	2,026	557,000	2,968,000	18.78	3,609	2,360	5,178	67,294	317,597	21.19	148,410	153,543	96.66
Empire	2,741	582,000	1,917,000	30.37	1,700	1,105	. . . .	58,344	146,331	39.87	91,286	92,652	98.53
Florida	1,042	136,000	491,000	27.69	595	212	. . . .	13,740	55,135	24.92	63,012	61,436	99.65
Monarch	1,810	453,000	2,561,000	17.69	2,022	1,407	6,011	55,009	200,360	27.46	142,279	156,085	91.15
Piedmont	5,610	1,203,000	4,701,000	25.60	2,616	2,694	3,453	123,908	435,813	28.43	225,838	225,494	99.27
Pioneer	8,732	2,382,000	8,099,000	29.41	7,309	2,179	6,072	225,310	857,180	26.29	336,942	338,396	99.57
Robinson	3,003	451,000	1,490,000	30.27	1,276	. . . .	1,663	41,286	150,678	27.40	70,974	75,493	92.90
Southwest	7,960	1,450,000	4,275,000	33.92	4,133	2,635	11,279	163,386	426,963	38.27	203,207	205,228	98.13
Trans-Texas	3,066	755,000	4,896,000	15.42	5,561	2,315	929	78,248	419,636	18.65	233,131	233,204	99.97
West Coast	4,477	576,000	2,067,000	27.85	810	715	. . . .	52,666	186,864	28.18	98,449	101,279	97.21
Wis. Central	1,583	217,000	908,000	23.90	1,484	1,220	. . . .	23,148	104,737	22.10	112,676	135,966	82.70
TOTALS	42,859	8,855,000	35,335,000	25.06	35,403	19,908	34,585	918,754	3,407,549	26.96	1,908,280	1,971,686	96.49
						Helicopter Mail Service							
Los Angeles	. . . .	. . . .	. . . .	. . .	4,004	. . . .	. . . .	4,004	12,246	32.67	32,083	32,427	98.94

* Started passenger service March 7, 1949.

U. S. International Airline Traffic for February

Airlines	Revenue Passengers	Revenue Passenger Miles	Available Seat Miles	Passenger Load Factor	U. S. Mail Ton-Miles	Foreign Mail Ton-Miles	Express Ton-Miles	Freight Ton-Miles	Total Ton-Miles Rev. Traffic	Available Ton-Miles Flown	% Available Ton-Miles Used	Revenue Plane-Miles	Scheduled Miles	% Scheduled Miles Completed
				%										
American	3,665	5,262,000	7,939,000	66.28	10,383	2,937	. . . .	90,182	675,935	1,072,086	63.05	174,019	163,837	100.00
Amer. O'Seas	4,644	9,164,000	18,772,000	48.82	114,096*	54,775	355,409	. . . .	1,549,683	2,686,829	57.68	536,691	519,332	90.26
Braniff	732	1,244,000	3,893,000	31.95	1,295	213	. . . .	14,472	136,688	561,641	24.34	88,335	95,565	88.88
C & S	2,260	2,090,000	5,446,000	38.38	865*	266	. . . .	24,606	239,963	653,252	36.73	110,148	111,821	98.50
Colonial	854	673,000	2,649,000	25.42	713*	77	. . . .	6,119	80,205	388,899	20.62	60,230	59,960	100.00
Eastern	826	1,289,000	3,251,000	39.65	2,387*	. . . .	. . . .	38,640	182,084	370,115	49.20	58,240	58,240	100.00
National	5,777	1,560,000	2,476,000	63.00	905	. . . .	49,363	. . . .	208,621	395,825	52.71	57,329	45,058	100.00
Northwest	2,164	4,147,000	10,496,000	39.51	170,927	13,203	10,018	306,334	976,506	1,789,072	54.58	452,289	452,808	99.23
Panagra	8,252	9,674,000	14,819,000	65.28	28,766	17,508	103,452	88,313	1,301,152	2,229,538	58.36	458,844	449,660	99.69
Pan American														
Latin Amer.	66,629	45,710,000	82,337,000	55.52	203,875	67,778	1,860,521	19,794	6,796,812	12,697,732	53.53	2,431,104	2,483,179	97.55
Atlantic	7,379	17,187,000	28,968,000	59.33	167,501*	68,202	596,998	2,439	2,757,440	4,865,992	56.67	955,327	934,704	96.02
Pacific	5,890	17,180,000	29,546,000	58.15	431,236	68,859	348,531	. . . .	2,609,577	4,617,098	56.52	1,294,482	1,267,146	98.67
Alaska	1,979	2,126,000	5,034,000	42.23	29,244	. . . .	225,324	. . . .	475,542	963,915	49.33	181,305	181,140	96.99
TWA	5,275	15,266,000	29,566,000	51.63	187,468*	98,542	517,457	. . . .	2,517,818	4,149,880	60.67	869,435	823,554	99.84
United	1,843	4,543,000	5,973,000	76.06	51,586	. . . .	6,367	. . . .	526,063	652,772	80.59	136,794	134,400	100.00
TOTALS	118,169	137,115,000	251,165,000	54.59	1,401,247	392,320	4,073,440	590,899	21,034,089	38,094,646	55.21	7,864,572	7,780,404	97.57

* In addition to mail ton miles the following international parcel post ton miles were listed: American Overseas 22,296 (parcel post for January was 24,668 — U.S. Mail Ton-Mile figure corrected to read 116,403); C & S 64; Colonial 117; Eastern 113; PAA Atlantic Div. 19,851; TWA 33,689

NOTE: Data in above tabulations were compiled by American Aviation Publications from monthly reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; C & S to Havana; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

U. S. International Airline Revenues & Expenses for 1948

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	U. S. MAIL REVENUES***	FOREIGN MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRANSPORT REV.	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME
American	$ 3,541,615	$ 2,887,457	$ 60,259	$ 56,344	$	$ 288,791	$ 53,484	$	$ 3,681,808	$ 1,853,623	$ 1,828,186	$ -140,194
Amer. O'Seas	23,537,458	15,412,944	3,937,790	904,752	1,546,461	. . . .	292,137	1,282,421	21,653,066	10,488,044	11,165,022	1,884,392
Braniff	1,129,667	525,345	569,497	2,616	. . . .	15,103	12,901	. . . .	1,282,277	672,855	609,421	-152,610
C & S	2,020,611	1,026,474	910,838	. . . .	. . . .	56,444	22,494	. . . .	1,766,194	822,071	944,123	254,417
Colonial	1,411,407	1,013,241	354,933	. . . .	. . . .	36,255	6,918	. . . .	1,627,216	699,028	928,188	-215,809
Eastern	923,459	781,935	30,174	. . . .	. . . .	100,275	11,074	. . . .	982,414	491,041	491,372	-58,954
National	778,006	560,538	94,257	. . . .	97,722	. . . .	17,420	8,068	933,595	386,775	546,821	-155,589
Northwest	11,895,544	5,653,789	4,630,901	388,128	28,511	873,447	112,327	234,539	10,584,730	5,089,541	5,495,189	1,310,814
Panagra*	13,906,853	10,355,461	1,074,983	736,317	1,201,985	127	385,289	36,504	15,300,647	6,782,029	8,518,618	-1,393,794
Pan American												
Latin Amer.	62,244,242	40,054,824	8,710,181**	2,022,197	8,131,600	. . . .	1,355,813	582,221	59,419,720	24,801,899	34,617,821	2,824,522
Atlantic	44,883,293	25,444,696	12,836,202**	1,446,538	2,931,079	. . . .	652,943	1,203,786	41,113,680	20,405,156	20,708,524	3,769,613
Pacific	32,821,125	18,419,776	10,874,497**	485,760	2,452,234	. . . .	337,414	139,466	31,223,032	16,341,668	14,881,364	1,598,093
Alaska	5,260,542	2,463,162	1,975,606**	. . . .	792,371	. . . .	14,012	8,456	5,054,276	2,318,869	2,735,407	206,266
TWA	39,181,846	23,434,106	9,291,806	2,354,636	2,341,319	. . . .	787,779	686,428	37,663,753	18,295,914	19,367,840	1,518,093
United	3,841,005	3,127,515	414,956	. . . .	88,449	. . . .	55,705	110,516	3,305,185	1,737,612	1,567,573	535,820
TOTALS	247,376,673	151,161,263	55,766,880	8,397,288	19,611,731	1,370,442	4,117,710	4,292,405	235,591,593	111,186,125	124,405,469	11,785,080

* Figures for Panagra are preliminary.

** Represents company's estimate of amount which should be received in accordance with the terms of the Civil Aeronautics Act when permanent rates are established. Estimate exceeds temporary rates in effect and permanent rates under review by:
Latin American Div. $6,562,795; Atlantic Div. $6,414,350; Pacific Div. $-3,100,501; Alaska Div. $670,731

*** Mail revenues include following amounts in retroactive payments: National $22,101; TWA $2,174,384

U. S. International Airline Revenues & Expenses, Oct.-Dec., 1948

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	U. S. MAIL REVENUES***	FOREIGN MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRANSPORT REV.	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME
American	$ 924,074	$ 779,601	$ 19,281	$ 12,335	$	$ 67,236	$ 13,720	$	$ 891,290	$ 436,070	$ 455,219	$ 32,784
Amer. O'Seas	6,659,642	3,632,598	953,775	446,958	493,274	. . . .	86,026	1,033,954	5,789,827	2,842,555	2,947,272	869,815
Braniff	507,795	239,813	248,491	1,982	. . . .	8,233	6,584	. . . .	585,708	305,877	279,831	-77,913
C & S	850,598	420,253	385,911	. . . .	. . . .	26,585	13,800	. . . .	694,421	314,015	380,406	156,177
Colonial	269,813	160,228	95,615	. . . .	. . . .	12,210	1,699	. . . .	407,162	179,378	227,783	-137,349
Eastern	155,160	111,851	10,633	. . . .	. . . .	30,611	2,065	. . . .	240,452	114,349	126,103	-85,292
National	234,578	153,768	39,846	. . . .	27,704	. . . .	5,727	7,532	248,559	106,171	142,388	-13,981
Northwest	3,528,856	1,793,821	1,202,302	108,702	11,357	386,441	33,818	. . . .	3,113,408	1,555,126	1,558,283	415,448
Panagra*	3,574,518	2,636,210	274,218	178,591	327,131	127	106,961	18,740	4,018,192	1,809,450	2,208,742	-443,674
Pan American												
Latin Amer.	16,135,412	9,602,012	2,871,100**	504,196	2,227,518	. . . .	344,515	80,765	15,247,414	6,596,701	8,650,713	887,998
Atlantic	11,838,127	5,707,581	4,145,684**	471,543	847,134	. . . .	169,937	413,927	10,880,868	4,798,445	6,082,422	957,259
Pacific	8,613,260	4,730,515	2,624,279**	179,509	914,966	. . . .	101,995	30,409	8,101,591	3,875,903	4,225,688	511,669
Alaska	1,147,556	538,760	313,023**	. . . .	289,276	. . . .	3,123	. . . .	1,186,163	527,462	658,700	-38,606
TWA	13,410,347	6,692,295	4,519,203	693,956	862,772	. . . .	216,820	318,068	9,782,292	4,992,751	4,789,541	3,628,055
United	1,204,025	826,434	206,629	. . . .	32,045	. . . .	18,556	93,736	884,603	485,764	398,839	319,421
TOTALS	69,053,761	38,025,740	17,909,990	2,597,772	6,033,177	531,443	1,125,346	1,997,131	62,071,950	28,940,017	33,131,930	6,981,811

* Figures for Panagra are preliminary.

** Represents company's estimate of amount which should be received in accordance with the terms of the Civil Aeronautics Act when permanent rates are established. Estimate exceeds temporary rates in effect and permanent rates under review by:
Latin American Div. $2,236,388; Atlantic Div. $2,558,773; Pacific Div. $-866,951; Alaska Div. $-19,200

*** Mail revenues include following amounts in retroactive payments: National $22,101; TWA $2,174,384

U. S. Airline Balance Sheet Data as of Dec. 31, 1948

AIRLINES	TOTAL ASSETS	CURRENT ASSETS	INVESTMENTS & SPECIAL FUNDS	OPERATING PROP. & EQUIPMENT	DEFERRED CHARGES	CURRENT LIABILITIES	LONG-TERM DEBT	DEFERRED CREDITS	OPERATING RESERVES	CAPITAL STOCK	SURPLUS
American	$117,126,161	$ 29,020,462	$15,716,770	$ 67,138,567	$ 2,149,590	$18,634,795	$ 40,000,000	$1,291,966	$	$46,452,835	$ 10,746,565
Amer. O'Seas	27,082,848	13,204,305	2,851,457	9,747,292	1,279,794	3,157,592	4,700,000	1,616,638	402,381	1,749,825	15,256,770
Braniff	14,964,235	5,977,277	200,968	7,707,581	808,527	3,137,898	4,192,970	196,862	19,819	2,500,000	4,916,687
Capital	17,132,045	8,920,740	73,446	5,783,737	492,837	6,562,620	9,850,000	294,028	14,680	479,083	-68,366
Caribbean	430,462	76,997	6,853	291,498	39,952	72,157	3,718	8,524	61,608	94,538	191,686
C & S	6,406,931	4,089,637	18,191	1,883,640	336,416	1,254,929	. . . .	147,102	. . . .	4,893,645	111,255
Colonial	3,691,979	2,473,628	43,135	1,128,155	47,061	802,828	150,000	90,793	57,259	515,600	2,075,499
Continental	4,671,781	1,915,961	9,170	2,461,987	284,614	1,061,075	1,325,000	39,393	. . . .	386,757	1,859,556
Delta	13,127,967	4,278,529	118,465	8,216,290	514,683	2,966,226	3,425,000	198,607	15,150	1,500,000	5,022,983
Eastern	56,858,906	34,894,594	1,644,431	17,700,638	2,619,243	15,994,891	12,000,000	1,688,768	1,764,204	2,395,572	23,015,470
Hawaiian	2,732,167	1,255,526	57,523	1,316,325	45,309	414,538	. . . .	80,898	. . . .	1,750,000	486,730
Inland	662,049	487,133	3,670	57,847	4,841	226,394	. . . .	49,606	. . . .	164,218	221,831
MCA	3,156,115	1,898,372	31,721	1,160,904	60,294	1,117,301	117,076	47,104	54,733	390,779	1,369,122
National	8,977,218	2,192,389	66,261	6,357,497	351,627	3,057,853	1,578,947	342,712	106,893	749,987	3,140,826
Northeast	3,585,485	1,453,470	183,124	1,854,147	81,919	255,014	320,000	66,449	82,420	2,125,864	735,738
Northwest	35,562,188	12,717,198	3,570,010	18,480,515	646,077	5,787,962	8,100,000	600,655	. . . .	17,957,550	3,116,021
PAA System	159,330,357*	48,485,176	27,265,906	61,092,793	22,486,353	24,555,444	85,342,519	14,018,069	2,439,335	1,000,000	31,974,991
Panagra**	14,774,319	8,117,554	272,313	5,694,040	690,412	4,122,322	2,600,000	2,392,035	2,252,827	4,750,000	-1,342,865
TWA	85,747,638	28,613,962	6,443,737	45,313,322	5,024,816	17,789,599	55,314,750	4,174,261	. . . .	10,102,800	-1,633,772
United	99,459,541	28,805,918	3,148,135	63,230,693	2,391,552	16,645,702	32,640,000	4,034,698	. . . .	30,172,767	8,821,958
Western	13,110,376	3,975,458	415,584	7,817,965	683,327	4,541,836	3,550,776	300,162	272,000	525,164	3,920,439
TOTALS	688,590,768	242,854,286	62,136,870	334,435,433	41,039,244	132,158,976	265,270,756	31,679,330	7,543,309	130,656,984	113,939,124

* Includes $14,248,264 in estimated mail pay in excess of amount accrued under temporary and final rates under review.

** Figures for Panagra are preliminary.

Advertisers In This Issue

Classified Advertising

The rates for advertising in this section are as follows: "Help Wanted," "Positions Wanted," "Aircraft Wanted or For Sale," and all other classifications $1.00 a line, minimum charge $4.00. Estimate bold face heads 30 letters and spaces per line; light body face 40 per line; box numbers add two lines. Terms, cash with order. Forms close 20 days preceding publication date. Rates for display advertisements upon request. Address all correspondence to Classified Advertising Department, AMERICAN AVIATION PUBLICATIONS, 1025 Vermont Avenue, NW., Washington 5, D. C.

HELP WANTED

ASSISTANT SYSTEM MANAGER AGE 33-38 YRS.

Large motor transportation company national in scope with general office in middle west has opportunity for capable young executive. Position demands broad supervisory transportation experience in traffic, sales, operations, claims, accounting and personnel relations. Must be outstanding in administration and have ability to conduct group meetings Give full details including qualifications, photograph, references and salary expected. Box No. 660, AMERICAN AVIATION, 1025 Vermont Ave., N. W., Washington 5, D. C.

Foreign Transport Equipment: The foreign air transport section division of the CAB has distributed a 32-page study of "Equipment of the Foreign Scheduled Common Carrier Airlines". The study lists in detail the equipment used by 171 scheduled common carrier airlines of all foreign countries but does not cover the United States, Hawaii, and Puerto Rico nor detailed Alaskan equipment. The report was compiled from information available as of March 1, 1949.

Copies of the report are available from the Foreign Air Transport Division, Bureau of Economic Regulation, Civil Aeronatuics Board, Washington 25, D. C.

POSITION WANTED

LOOKING FOR A FUTURE

Young man, five years experience large airline in all phases of operatoins, desires position with smaller aviation concern or airport. College education, ambitious. Further information on request. Interview welcomed. Box No. 661, AMERICAN AVIATION, 1025 Vermont Ave., N. W., Washington 5, D. C.

HELICOPTER PILOT, 25, wants position as pilot in rotary-wing operations. Recently arrived from Sweden; holds U. S. commercial helicopter license. 2½ years Swedish Air Force; 2 years as pilot in SAS trans-Atlantic operations. Holds Swedish commercial license with instrument rating, navigator and radio licenses. Speaks fluent English, German and Swedish. Box 659, AMERICAN AVIATION, 1025 Vermont Ave., N. W., Washington 5, D. C.

ENGINEER, 36, B.S. in M.E., fifteen years extensive experience in aviation maintenance, particularly with all forms of aircraft power plants. Past employment with two major engine manufacturers, a major aircraft manufacturer, and a prominent international airline. Wide acquaintance with key personnel airlines, aircraft manufacturers, distributors, service bases, AAF, and Navy Bureau of Aeronautics. Desires connection with growing operator or manufacturer. Travel or live anywhere. Box 662, American Aviation, 1025 Vermont Ave., N. W., Washington 5, D. C.

NEED A PILOT? NEED A JOB?

Are you qualified to fly the Atlantic, to instruct, to fly charter, to dust, or to help organize a new airline? We can help you find the job you need, or the man you need. No registration fee. PILOTS EMPLOYMENT AGENCY, Box 152, Whippany, N. J.

WINGS OF YESTERDAY

25 Years Ago

On May 23, 1924, the Commercial Aircraft Association of Akron, Ohio, was organized "to promote the financial welfare of individuals interested in commercial aeronautics."

•

To commemorate the pioneer achievement in aeronautics of the Wright Brothers, the Dayton Section of the Society of Automotive Engineers proposed to give a medal annually as a prize for the most meritorious contribution to the science of aeronautics reported to them during the year.

10 Years Ago

(In American Aviation)

The 42-passenger Douglas DC-4 was awarded an approved type certificate by the CAA and embarked on a 60-day tour over the routes of five major airlines. Several carriers, including United, were thinking of placing orders for the new four-engined transport.

•

American Export Airlines filed a trans-Atlantic application asking authorization to operate from New York to Marseilles, France.

•

Pan American Airways operated the first regularly scheduled trans-Atlantic passenger, mail and express service from Port Washington, Long Island, to Marseilles in 45 hrs. 38 minutes. It was permitted to operate two round-trips weekly.

LETTERS

Refreshing & Factual

To the Editor:

I have just finished reading your editorial—"Fighting Solves Nothing." It was refreshing and factual.

JOHN BERRY
Commissioner of Airports
Cleveland, Ohio

Airports & Airlines

To the Editor:

Two points regarding your editorial in the May 15 issue, with which I have no disagreement.

You say, "Some airport managers . . . suspect the worst" in dealing with airlines. Ah, yes! Having worked for an airline and the CAA and now being a "newcomer" in the management field, I can say at least that I have been on one side of the fence, a-straddle it, and now view the sordid scene from the other.

Remove the cause and you remove the suspicion. I have no brief for airport managers because long ago I, alone, cried in the wilderness that calling an airport *manager* an *airport* manager didn't make him an *airport manager*, BUT the airlines have had a suave way of going over the airport manager's head to negotiate or pave the way therefor with a mayor or a commission. There is the grounds for suspicion. Let the airlines deal with the manager *first*, and if the so-and-so doesn't merit respect, *then* let them go after him *in the open*.

The onus of ignorance as to historical perspective and appreciation should not be placed on airport management alone, however. "The vast overall problems which confront the nation's air transportation system" are not necessarily nor commonly seen with clarity and understanding by air carrier eyes. Often they are guilty of seeing only that which is flashed on the screen by venerable appearing and/or acting codgers who've no business being where they are, but there they are, just the same.

At Oklahoma City this April and in Chicago in preceding years the AAAE delegates have made noises concerning the inequalities between their alleged responsibility and commensurate authority. Too many, observation reveals, have been afraid that their bluff might be called and have looked furtively over their shoulders for a bit of comforting brush behind which they might conceal themselves, thus perhaps fully justifying airline action in going to higher-ups.

On the other hand, the airlines' inability or unwillingness to pay proportionate costs led to the Dudley Steele "merchandise mart" philosophy, as headlined by George Gardner in his Denver remarks on "charge 'em," or what I attempt to portray by asking "Are airport managers prostitutes, having found out they can sell it now?"

R. W. F. 'BOB' SCHMIDT
Manager
Tucson Municipal Airport
Tucson, Ariz.

Lightplane Development

To the Editor:

I enjoyed and appreciated your editorial in the current *American Aviation* on the subject of Field Force use of liaison aircraft. However, I feel that one vital point was overlooked in your summary of the situation. This is the fact that although the Field Forces and the manufacturers are equally anxious to see increased development and usage of liaison aircraft, the lack of funds available for this purpose makes any real program impossible.

Looking at it from this angle, it would seem that editorial matter directed toward awakening the public and the Congress to this need would aid in bringing about a much fuller utilization of liaison aircraft by the Field Forces, as well as permit the undertaking of developmental contracts to make possible those improvements necessary to the military requirements and equally of value to the civilian user.

Your expanded editorial service to the personal plane industry, fixed base operators and others involved in the overall civil aviation world is indeed helpful.

JOSEPH T. GEUTING, JR.
Manager,
Personal Aircraft Council
Aircraft Industries Association

BOOKS

FLIGHT INTO HISTORY, The Wright Brothers and the Air Age, by Elsbeth E. Freudenthal. University of Oklahoma Press, Norman, Okla. 268 pages. $3.75.

This well-documented volume is essentially a history of the first decade of flying (1900-1910), which was dominated by the Wright brothers. It is a well-told story of the race between many men for the honor of being the first to fly, based on careful examination of the records and evidence. Of special interest is the account of the long relationship of the Wright brothers with Octave Chanute, their precursor and friend.

The author stresses that "clear-cut labels, trying to state in a few words a complicated accomplishment, obscure the true contributions of the Wrights. Whether they were the first to rise from the ground—and it seems true that they were not—is an inaccurate gauge of their achievement. It appears indubitable that they were the first to demonstrate controlled mechanical flight.

"Much more important was their role of midwives to the business of flying. It was the Wright brothers who, as businessmen, insisted on making the science and theory of aeronautics into a paying business. They themselves did not realize their role, for their emphasis was on their claims of being scientists whose inventions had enabled them to fly first. They were, actually, practical businessmen, seeking a return on their investments of much time and small amounts of money, and it shocked them to think that success could not result in money."

FUNDAMENTALS OF SOFT SOLDERING, by Charles Yerkow. Published by Manual Arts Press, 237 Monroe St., Peoria, Ill. 96 pages, illustrated. No price listed.

This is a pocket-sized, hard-cover book analyzing basic requirements of the job of soldering and then telling how these requirements can be met. The essentials are listed as cleanliness, knowledge of solders and fluxes, proper working tools and equipment, and knowing how to judge heat. Through the use of photographs and sketches, the author arranges his material so that a beginner can follow the operations without the aid of an instructor. Included in the book are hints on soldering with an iron or flame burner, soldering of various types of metals and suggestions for mass-production methods.

THE HOUSE OF GOODYEAR by Hugh Allen. Published by The Corday & Gross Co., 1771 East 25th St., Cleveland 14, Ohio. Second edition, 700 pages, illustrated. Price $3.

See page 35 for review.

OBITUARY

Paul E. Richter

Paul E. Richter, one of the founders of TWA and until recently president of TACA Airways, died May 15 in Berkeley, Calif., of a cerebral hemorrhage at the age of 53.

Richter was associated with Jack Frye and the late Walter Hamilton in forming the Aero Corporation of California, a forerunner of TWA, in 1926. When TWA was organized in 1931, he became superintendent of the western region, later serving as vice president-operations and as executive vice president and director.

He resigned in April, 1947, and in September of that year was named president of TACA. Just a few weeks before his death, he had resigned that position to join the Coca Cola Co.

E. Scott Osler

E. Scott Osler, 41, Boeing Airplane Co. test pilot, was killed May 12 when the pilot's canopy of the XB-47 jet bomber he was flying became partly loosened and struck him on the head.

Captain Bill Odom and his "Waikiki Beech" – hold the new world-distance record for light planes – non-stop from Honolulu to Teterboro, N. J. – 4,957.24 miles officially credited Great Circle distance.

One plane could do it...and it did!

The 5,273-mile non-stop flight of Captain Bill Odom in a BEECHCRAFT Bonanza demonstrates the unique efficiency of the Bonanza. No other personal type airplane could have performed this flight because no other comparable airplane can deliver the same high speed with so little fuel consumption. (Odom averaged 7.56 gallons per hour at 146.3 miles per hour, or 19.37 miles per gallon.)

The Bonanza is designed and built to attain high speed with minimum power expenditure. Owners everywhere report that this high-operating efficiency reduces their fuel and oil costs substantially, and keeps maintenance costs at a minimum. An engine that operates at airline percentages of power output (from 50 to 65 per cent) is more reliable and less expensive to run.

The unique efficiency designed into the BEECHCRAFT Bonanza is a financial asset to every owner.

Apply Bonanza Transportation to your business

Company ownership of this fast, *quiet* plane turns travel days into travel *hours* – time saved you can put to *profitable* use. Investigate! A note on your company letterhead will bring an informative 60-page brochure on "The Air Fleet of American Business." Write today to Beech Aircraft Corp., Wichita, Kansas.

Top speed, 184 mph
Cruising speed, 170 mph
Range 750 miles

Beechcraft
BONANZA
MODEL A35

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

SOUTHWEST AIRMOTIVE COMPANY, Love Field, Dallas, founded in 1932, is an international favorite of flying executives — famous for its fast, courteous "super service" on the flight line. Said to be the nation's No. 1 maintenance plant for executive aircraft and engines, Southwest Airmotive has a second-to-none reputation as a "one stop" service station. Customers are met by crews who help them with their baggage, tidy up their planes, and escort them to a comfortable lounge with rest rooms, telephones, information girls, coffee shop and other facilities. Planes are promptly serviced — *Texaco Aviation Lubricants and Fuels are readily available.*

Southwest Airmotive Company Builds Business with...

"one stop" service plus TEXACO PRODUCTS

IN one typical month, there were some 650 executive plane movements off Southwest Airmotive's 25-acre concrete parking ramps, the planes representing 34 states and four Latin American countries. *Only superior service and quality products can build business like that!*

Everywhere, airports noted for service back it up with products of quality — with Texaco. Millions know the Texaco name and trade mark as symbols of quality. And the Texaco Line of aviation products is complete — lubricants and fuels to meet every aircraft need.

Best evidence of Texaco's leadership in the aviation field is this fact: *More revenue airline miles in the U. S. are flown with Texaco Aircraft Engine Oil than with any other brand!*

Let Texaco help you build a bigger business. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, *Aviation Division,* 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants and Fuels

FOR THE AVIATION INDUSTRY

Tune in . . . TEXACO STAR THEATRE presents MILTON BERLE every Wednesday night. See newspaper for time and station.